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ABSTRACT

This vocational education safety standards plan outlines rules and regulations adopted by the Board of Education of Middlesex County Vocational and Technical High Schools. The first of eleven chapters presents demographics and a safety organization table for Middlesex County Vocational and Technical Schools. In chapter 2, six safety program objectives are stated; three objectives involve meeting safety standards with proper tools, machines, equipment, and personal protective devices. Chapter 3 states the Board of Education's policies for safe operation of vocational courses. Chapter 4 gives specific statements on safety practices and precautions. The fifth chapter presents plans for periodic inspections and maintenance of facilities and equipment. In chapter 6 plans for identification and elimination of potential hazards are outlined. Chapter 7 delineates emergency procedures to be followed in the event of an accident involving a student, teacher, or any other individual. Chapters 8 and 9 recommend methods for providing and assessing students' safety education. The safety budget is presented in chapter 10. The final chapter lists resource materials. Thirty-four samples, such as a shop safety survey, are interspersed throughout the text. Appendixes contain the New Jersey Administrative Code, Title 6, Chapter 40, and information on the Vocational Education Accident Reporting System. (CSS)

ED160866

SAFETY STANDARDS PLAN

FOR

MIDDLESEX COUNTY VOCATIONAL & TECHNICAL HIGH SCHOOLS

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July 1978

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PREFACE

This Vocational Education Safety Standards Plan outlines the rules and regulations adopted by the Board of Education of the Middlesex County Vocational and Technical High Schools. The Plan meets the State rules and regulations prescribed by the State Board of Education pursuant to New Jersey Statutes Annotated 18A: 33-1 et seq., 18A: 40-12.2 and 18A:54-1 et seq. It provides the safety standards to govern the use of tools, machines, equipment and protective devices in the vocational education programs and courses offered in the Middlesex County Vocational and Technical High Schools.

Most aspects of this Plan have been in operation for many years. A considerable number of samples have therefore been included within the body of the text. (These are on colored pages.) Instruction in safety has always been – and will continue to be – the very foundation of the curriculum at Middlesex County Vocational and Technical High Schools.

J. Henry Zanzalari
Superintendent

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CHAPTER I
OVERVIEW OF THE MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS

A. Sites

The Board of Education of the Middlesex County Vocational and Technical High Schools operates secondary, post-secondary and adult education programs throughout Middlesex County at a variety of sites. These sites include not only the traditional school sites but also the community out-reach sites encompassing industrial plants, detention facilities and mobile training units.

Specifically, the sites are:

Middlesex County Vocational and Technical High School, New Brunswick
Middlesex County Vocational and Technical High School, Perth Amboy
Middlesex County Vocational and Technical High School, Woodbridge
Middlesex County Vocational and Technical High School, East Brunswick
Middlesex County Vocational and Technical High School, Piscataway
Special Needs Wing, East Brunswick
County Detention Home
County Workhouse
In-Plant Sites such as Ross Engineering, Highland Park
Mobile Training Units (Trailers)

B. Vocational and Technical Programs

The Board of Education of the Middlesex County Vocational and Technical High Schools offers a variety of vocational and technical programs on the secondary, post-secondary and adult levels.

Secondary and post-secondary programs are offered in the the following areas:

Agriculture Education
Business Education
Health Occupations Education
Home Economics Education
Consumer Education
Technical Education
Vocational Industrial Education
Employment Orientation and
Special Needs (Handicapped)

Adult Education programs are scheduled in:

- Apprentice Training
- Agriculture Education
- Health Occupations Education
- Home Economics Education
- Consumer Education
- Technical Education
- Vocational Industrial Education
- CETA Programs
- Special Needs (Handicapped)

In addition, there are the following offerings:

- Mobile Unit Program (Trailer)
  - Business Unit
  - Evaluation Unit
  - Small Engine Unit
  - Plastics Unit
- Dentention Home
  - High School Academic Courses
  - Mobile Units Program
- Workhouse
  - High School Equivalency
- Summer School Program
- Twilight-Tech Program
- Special Needs Programs (Handicapped)
- Athletic Program
- Cooperative Industrial Education
- Work Study

C. Career Opportunities

Career Opportunities	Mobile Units	East Brunswick	New Brunswick	Perth Amoby	Special Needs Wing	Woodbridge	Piscataway
Air Conditioning/Refrig.		x					x
Architectural Drafting		x					
Auto Body Repair		x					x
Auto Mechanics		x	x	x			x
Auto Servicing					x		
Baking		x				x	x
Beauty Culture		x				x	x
Building Services					x		
Building Trades					x		
Carpentry		x	x	x			x
Clerical Occupations	x				x		x
Commercial Art		x					
Commercial Foods		x			x	x	x
Diesel Mechanics							x
Distributive Education					x		
Dry Cleaning					x		
Electrical Trades		x	x	x			x
Electronics		x	x	x			
Employment Orientation (Special Needs)			x			x	
Fashion Design		x				x	x
Graphic Arts Careers		x					
Health Occupations		x				x	x
Health Services					x		
Machine Shop		x	x	x			x
Medical Secretary							x
Ornamental Horticulture		x					
Painting & Decorating			x	x	x		
Plastic Occupations	x						
Plumbing			x				x
Practical Nursing		x				x	x
Pre-Sheltered Workshop					x		
Radio & TV Servicing			x				
Small Engine Repair	x						
Sheet Metal				x			
Typing Skills	x						
Technical Drafting & Design			x	x			
Upholstery			x		x		x
Welding		x		x			x

D. Enrollments

The predicted enrollments for the school year 1978–79 including all programs are as follows.

	1978–79
High School	2749
Post-High School	450
Special Needs	370
Adults	8500
Dentention Home	Varies
Workhouse	Varies
Twilight Tech	200
Summer School	500
Mobile Units	1100

E. Graduates

With the increase in enrollment, the expected number of graduates will be:

	1977–78	1978–79
Day	595	745
Adult	215	220

F. Special Needs Program

The Special Needs program is open to classified handicapped students who reside in Middlesex County. There are two distinct features to the Special Needs program: Employment Orientation and Specific Shop Training. Employment Orientation is the shared-time phase. The students enrolled in the Employment Orientation phase come to the vocational school for one-half of a school day and return to their sending districts for the remainder of their school day. The objectives of this phase are as follows:

1. The development of acceptable work habits and attitudes.
2. The exploration of occupational areas.
3. The development of entry-level skills for a specific occupational area.

The Employment Orientation phase is non-graded and non-timed. A student spends as much time in this phase as his or her needs require.

Three Employment Orientation shops are in operation: two shops located in our New Brunswick school and one shop located in our Woodbridge school. These three shops accommodated a total of 60 classified handicapped students.

Location	Number of Students
New Brunswick School	40
Woodbridge School	20
	60

Once a student has achieved the objectives established in the Employment Orientation phase, he or she then moves into the second phase of the program, which is Specific Shop Training. In this phase, the student becomes a full-time student in the Middlesex County Vocational and Technical High School System. The student who is in this second phase is integrated into our regular shop offerings and into any or all academic offerings which he or she has the capacity and the capabilities of handling.

Specific shop training is offered in the following:
Auto Body, Auto Mechanics, Baking, Carpentry, Commercial Art, Commercial Foods, Electrical Trades, Electronics, Ornamental Horticulture, Machine Shop, Painting and Decorating, Plumbing, Technical Drafting and Upholstery.

G. Varsity Sports

The athletic program includes soccer, baseball, softball, basketball and volleyball, on varsity and junior varsity status. Boys have soccer, baseball and basketball, while the girls have basketball, softball and volleyball.

	East Brunswick	Perth Amboy	Woodbridge	New Brunswick	Piscataway
Soccer					
Varsity	x	x		x	x
Junior Varsity	x	x		x	x
Basketball					
Varsity	x	x	x	x	x
Junior Varsity	x	x	x	x	x
Volleyball					
Varsity	x		x		x
Junior Varisty	x		x		x
Softball					
Varsity	x		x		x
Junior Varisty	x		x		x
Baseball					
Varsity	x	x		x	x
Junior Varsity	x	x		x	x

H. Vocational Outreach Summer Program

The Vocational Outreach Summer Program is designed to serve those students not presently enrolled in the County Vocational Schools by providing an enrichment experience of "hands-on" learning, and those students presently enrolled in the Middlesex County Vocational and Technical High Schools by providing remedial instruction.

The enrichment program is designed to serve students as follows:

1. Provide a sequential program of occupational training over a period as long as three summers.
2. Provide an occupations awareness experience.
3. Provide a career exploration experience.
4. Provide the benefits of an enrichment program of the practical, hands-on type not usually found in their home high schools.
5. Perform a guidance function whose results, whether positive or negative, would be of benefit to the students.

The remedial program provides instruction in those subject areas, such as related subjects and shop, which are not normally provided for in local districts. This provides students presently enrolled in county vocational schools with the opportunity to repeat those subjects previously failed during the school year. This program services 170 students. School is in session 4 hours/day for 30 days.

I. Vocational Outreach Twilight Tech Program

The Twilight Tech Program represents an effort to accomplish two goals. They are:

1. To provide the opportunity for vocational education to more students than the present facilities can accommodate.
2. To more fully utilize the facilities by scheduling a program into the time period between the day and evening programs.

The educational goal calls for students to obtain manipulative skills sufficient for acquiring entry-level employment. This is done by scheduling students in a shop for 180 days. Students are issued certificates of completion at the end of the school year. Individual sequential programs with a three-year duration are possible. The program serves 200 students.

J. Mobile Vocational Education Program

Mobile Vocational Education is an outreach program. The major goal of this program is to bring vocational education and county vocational school services to local school systems. This is accomplished by the use of four mobile trailers.

The program provides vocational evaluation of student interest and ability for a variety of occupational areas and offers skilled training for careers in plastics, small engine repairs, marine engine repairs, and typing. In addition, there is an evaluation unit. These units serve 1100 students.

K. Cooperative Industrial Education

Cooperative Education is a part-time school and work program that permits students to complete their high school education while expanding their horizons with on-the-job experience.

This program is based on the following assumptions:

1. Our students have been well received in industry and have gained a foothold for full-time placement.
2. Teachers and counselors have been enthusiastically encouraging the implementation of this program.
3. Many of our students are ready for employment before completing four full years, due to the quality of their training and their advanced level of maturity.
4. Our students are placed in a favorable position for employment in areas where initial placement is difficult.
5. A program of this type is highly efficient in terms of the benefits received in relation to the expense involved.

L. Adult Evening School Program

The adult evening school program is a very important part of the overall educational program of the County Vocational School system. It is through the evening program that many of the direct contacts with industry and unions are made, their training needs made known, and provisions made to fulfill these needs.

The curriculum includes:

APPRENTICE TRAINING: These courses are offered for apprentices in sponsored programs. All classes meet two evenings per week.

CONSUMER AND HOMEMAKING: The main purpose of these courses is to provide for home improvement and for the appreciation and application of consumer values.

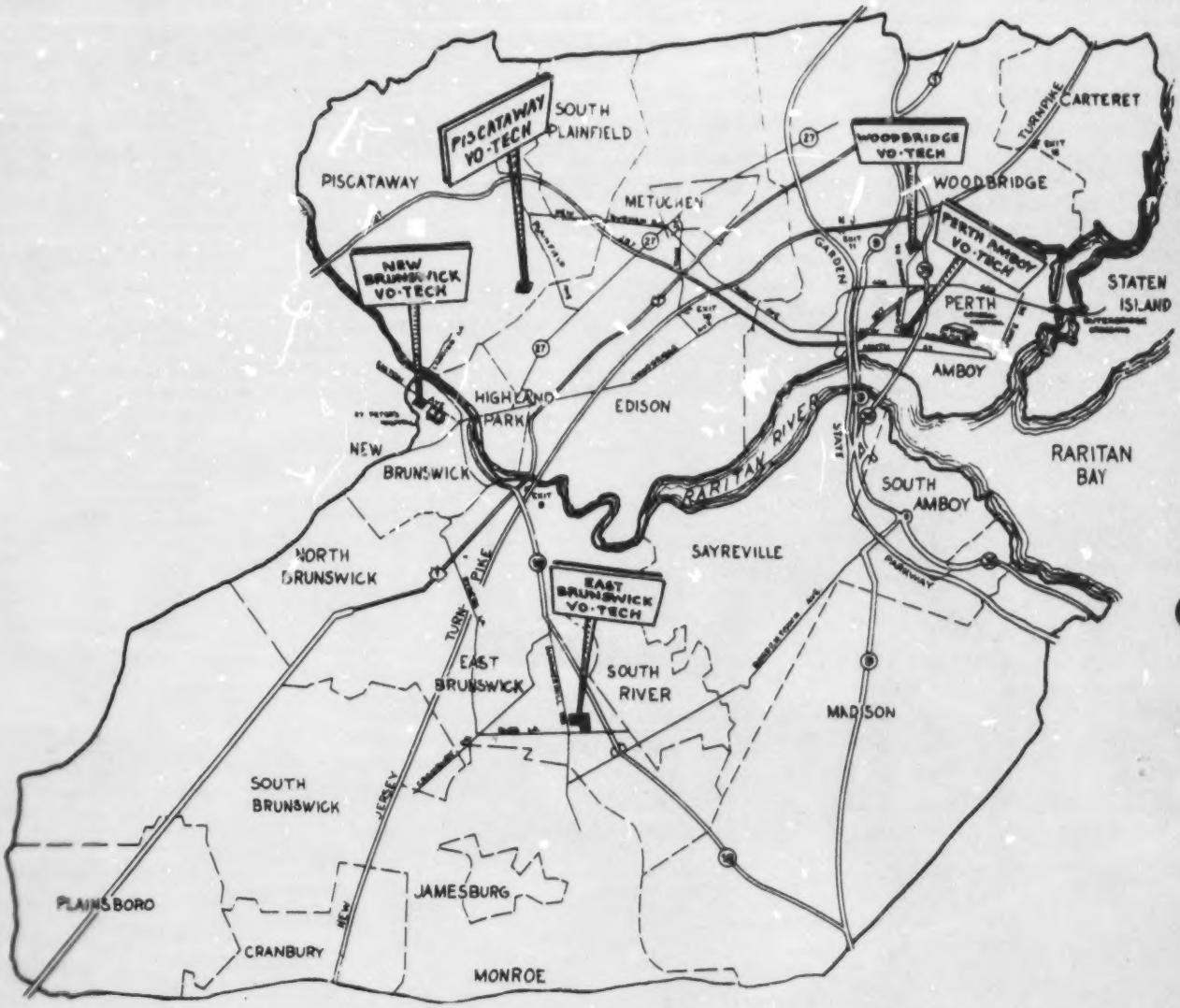
TRADE AND INDUSTRY: These courses are designed primarily for persons already employed in a trade who wish to improve their skills and knowledge. The main emphasis is on practical applications.

TECHNICAL: These courses involve mathematics and theory in addition to practical work. Certain courses prepare students for state license examinations.

TECHNICAL CERTIFICATE PROGRAMS: Air Conditioning and Refrigeration, Carpentry, Electrical Trades, Electronics, Industrial Instrumentation, Laboratory Technicians, Machine Shop, Welding. Upon completion of prescribed trade and technical courses a student is elegible for a Technical Certificate. Most of these programs are scheduled for two evenings per week for a duration of four years.

Any person 16 years of age or over not enrolled in a regular day school may attend. In most cases a high school diploma is desirable, but not necessary. Some courses require trade experience while others have specific prerequisites.

M. LOCATIONS OF MIDDLESEX COUNTY VOCATIONAL SCHOOLS



East Brunswick
112 Rues Lane
East Brunswick 08816
Phone 254-8700

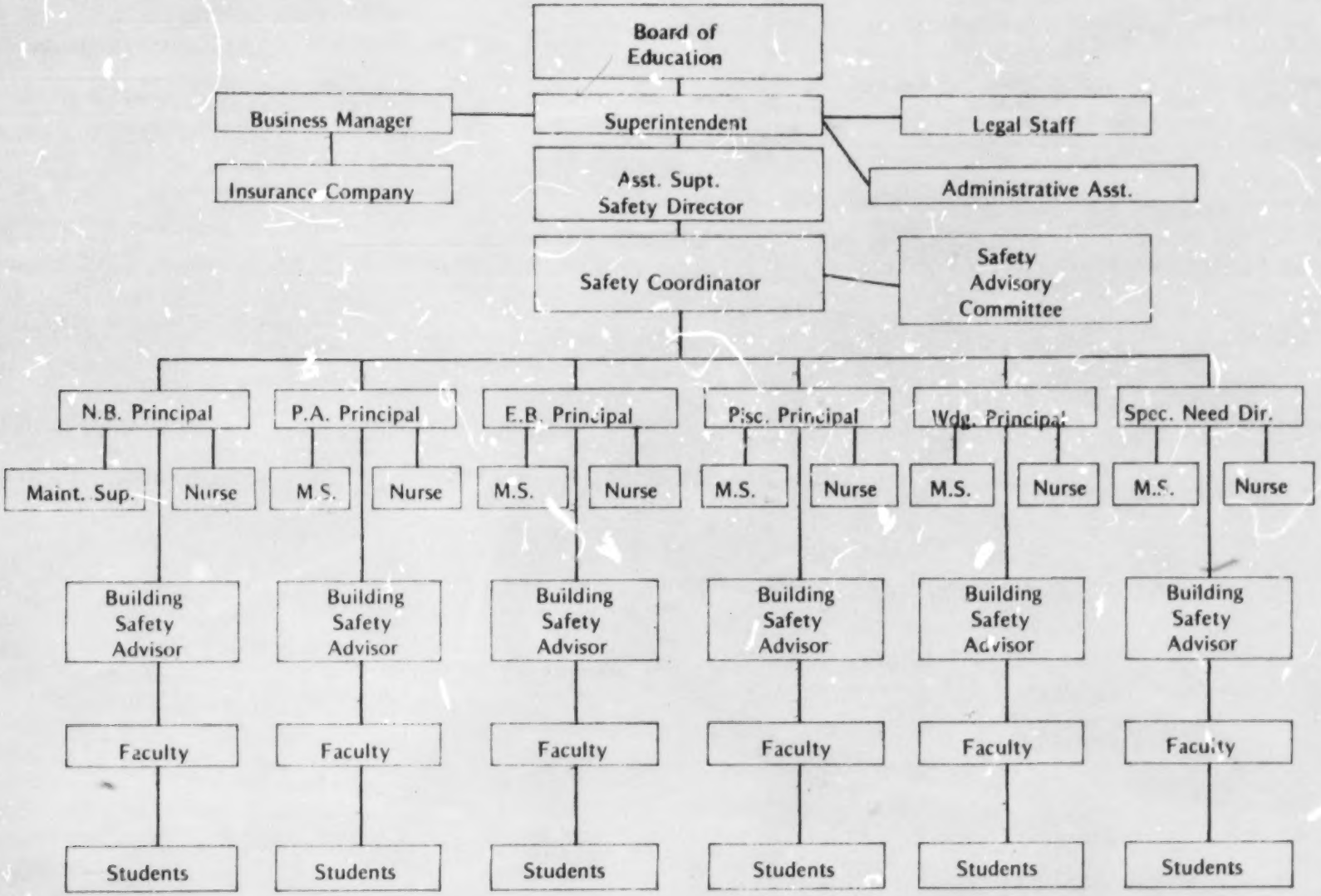
New Brunswick
256 Easton Ave.
New Brunswick 08901
Phone 247-3832

Perth Amboy
618 New Brunswick Ave.
Perth Amboy 08861
Phone 442-9595

Woodbridge
Convery Blvd. &
Florida Grove Rd.
Woodbridge 07095
Phone 634-5858

Piscataway
Cor. Suttons Lane &
Road 2
Piscataway 08854
Phone 985-0717

N. TABLE OF ORGANIZATION FOR SAFETY



CHAPTER II
OBJECTIVES OF THE SAFETY PROGRAM

A. Objectives

1. To insure that all tools, machines, equipment and personal protective devices ordered and acquired for use in the vocational education programs in the Middlesex County Vocational and Technical High Schools after August 3, 1977 shall meet the safety standards contained in this plan.
2. To insure that all other tools, machines, equipment and personal protective devices shall be brought into compliance with the standards herewith indicated by September 1, 1978.
3. To insure that all tools, machines, equipment and personal protective devices not brought into compliance within the specified time shall be removed from service.
4. To encourage the continuous up-dating of safety programs by students, faculty, staff, and the Safety Advisory Committee.
5. To insure that safety education shall not be confined to shops, but shall be part of the total curriculum, and such education shall also be implemented in academic and related classes, particularly in freshman curriculum, through the use of booklets, contests, awards and other specific activities.
6. To continuously analyze all factors relative to the causes of accidents and injuries for the purpose of prevention.

B. How the Objectives Are Met

1. Meeting Objectives 1, 2 and 3

> *"To insure that all tools, machines, equipment and personal protective devices ordered and acquired for use in the vocational education programs in the Middlesex County Vocational and Technical High Schools after August 3, 1977 shall meet the safety standards contained in this plan. . . . shall be brought into compliance by September 1, 1978 . . . or removed from service."*

Principals were directed to have each shop teacher fill out and return the shop safety form (Sample No. 1) and reinspect all shop equipment in the light of the revisions to NJAC 6:43. When the shop safety survey was completed, all equipment was brought into compliance or was removed from service.

Sample No. 1

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS

SHOP SAFETY SURVEY

School _____ Date _____

Teacher _____ Shop _____

	Satisfactory	Needs Attention	Does Not Apply
A. INSTRUCTION			
1. Shop Safety is taught as an integral part of each teaching unit.			
2. Safety rules are posted at each machine.			
3. Printed safety rules are given each student.			
4. The pupils take a safety pledge.			
5. The shop makes use of a safety inspector.			
6. There are shop safety committees – AM & PM.			
7. Safety contests are promoted.			
8. Motion and/or slide films on safety are used in the instruction.			
9. The shop has a safety suggestion box.			
10. Safety tests are administered.			
11. Safety posters are in evidence.			
12. Talks on safety are given to the classes by industrial representatives.			
13. Tours are taken of industrial plants as a means of studying safety practices.			
14. Periodic safety inspections of the shop are made by a student committee.			
15. Persons from industry make safety inspections of the shop.			
B. HOUSEKEEPING			
1. General appearance as to orderliness			
2. There is adequate and proper storage space for tools and materials.			
3. Benches are kept orderly.			
4. Corners are clean and clear.			
5. Special tools racks, kept in orderly condition.			
6. Tools, supply, and/or materials room is orderly.			
7. Sufficient scrap boxes and trash cans are provided.			

	Satisfactory	Needs Attention	Does Not Apply
B. HOUSEKEEPING (cont.)			
8. Scrap stock is put in scrap boxes promptly.			
9. Materials are stored orderly and in a safe condition.			
10. A spring-lid metal container is provided for oily rags and waste.			
11, All waste materials and oily rags are promptly placed in containers.			
12. Containers for oily rags and waste materials are emptied daily.			
13. Dangerous materials are stored in metal cabinets.			
C. EQUIPMENT			
1. Machines are arranged so that students are protected from hazards of other machines, passing students, etc.			
2. Danger zones are properly indicated.			
3. All equipment control switches are easily available to the operator.			
4. All machines are "Locked off" when instructor is out of the room.			
5. Brushes are used for cleaning equipment.			
6. Non-skid areas are provided around machines.			
7. Machines are in safe working condition.			
8. Machines are guarded to comply with Industrial Code or OSHA Requirements.			
9. Adequate supervision is maintained when students are using machines and dangerous tools.			
10. Tools are kept sharp, clean, and in safe working order.			
D. ELECTRICAL INSTALLATION			
1. All switches are enclosed.			
2. There is a master control switch for all of the electrical installations.			
3. An electrician changes fuses of over 30 amperes.			
4. Electrical outlets and circuits are properly identified.			

	Satisfactory	Needs Attention	Does Not Apply
E. PERSONAL PROTECTION			
1. Goggles are provided and required for all work where eye hazards exist.			
2. Hoods and goggles are properly disinfected before use.			
3. Shields are provided for electric welding.			
4. Aprons, coveralls, or shop coats are worn in the shop.			
5. Rings and other jewelry are removed by pupils when working in the shop.			
6. The proper kind of wearing apparel is worn for the job being done.			
7. Safety shoes are worn when needed.			
8. A respirator is used when spraying toxic materials.			
F. GENERAL PHYSICAL CONDITION			
1. Machines, benches, and other equipment are arranged so as to conform to good safety practices.			
2. Conditon of stairways			
3. Condition of aisles			
4. Condition of floors			
5. Condition of walls, windows, and ceilings			
6. Illumination is safe, sufficient and well placed.			
7. Ventilation			
8. Temperature control			
9. Fire extinguishers are of proper type, adequately supplied, properly located and maintained.			
10. Teacher and pupils know location of and use of the proper type for various fires.			
11. The number and location of exits is adequate.			
12. Proper procedures have been formulated for emptying the room of pupils in case of emergencies.			
13. Lockers are inspected regularly for cleanliness and fire hazards.			
14. Locker doors are kept closed.			

THE FOLLOWING ITEMS INDICATED POSSIBLE HAZARDS. IMMEDIATE ATTENTION IS REQUIRED.		
Item No.	Recommendations	
	To be implemented by Teacher and Students	To be done by Maintenance Crew or Other

Shop_____ School_____

Teacher_____

Date_____

2. Meeting Objective 4

"To encourage the continuous up-dating of safety programs by students, faculty, staff, and Safety Advisory Committee."

The shop supervisor, in the capacity of Safety Coordinator, meets with safety advisors from all schools to discuss the objectives for a total program. It is their responsibility to review and evaluate such activities as have taken place in the past, such as Safety Court, safety poster contests, and suspension procedures.

The advisors need not be shop teachers; however, shop certification is desirable.

The Safety Coordinator shall file a report at the end of the year, covering:

a. Expenditures and budget requirements for the coming year.
b. Summary and analysis of accidents based on accident reports.
c. Shop-by-shop tabulation of kind and number of injuries that occur in the various shops.
d. Tabulation of physical education and sports injuries.
e. Tabulation of other injuries.
f. Recommendations

SAFETY ADVISORY COMMITTEE –

Following the recommendations of the National Organization for Public Education, the Safety Advisory Committee shall consist of representatives from the following school divisions.

1978–79

Personnel: Mr. John Altounian, Chairman
Instructional: Dr. Cy Sommer, Secretary
Business: Mr. Eugene Butt
Also:
Maintainance Supervisor
School Nurse
Three representatives from industry
One parent
One school safety advisor

3. Meeting Objective 5

"Safety education shall not be confined to shops, but shall be part of the total curriculum, and such education shall also be implemented in academic and related classes, particularly in freshman curriculum. . ."

Safety advisors' job description calls for them to carry on a continuous program of activities which includes, but is not limited to:

a. Constant revision of shop safety booklets
b. Slogan contests
c. Bulletin board contests
d. Safety seminars

Freshman English Safety Project

A freshman safety-booklet project was an outcome of the 1973 teachers' workshop. The objective of the workshop was to raise the safety-consciousness level of every student and every teacher in the system. It is estimated that during the two-week period of this project, all teachers and students had devoted at least 25% of school time to one aspect or another of safety — plus considerable time at home on individual safety projects.

While this was a systemwide activity involving all shops and all academic and related classes, it was the consensus that for the future, the safety-booklet project should be a freshman English project only.

Samples of materials used in the safety project follow.

SHOP NEWSLETTER

Middlesex County Vo-Tech | November 2, 1973
Vol. 1, No. 2 | Cy Sommer, Editor

SAFETY SEMINARS PLANNED FOR ALL FOUR SCHOOLS

While the "save-harmless" law protects a teacher from financial loss when an accident occurs in his shop or classroom, there is no law that protects a teacher from his conscience when a student is injured.

To the extent that curriculum is defined as "...all of the experiences of the students under the guidance of the school..." and to the extent that an appreciation for the importance of safety is particularly important for our students whose objective is the acquisition of lifetime occupational skill, the teaching of safety becomes the most important* aspect of the entire vocational school curriculum.

It is for that reason that Dr. Zanzalari has asked me to set up a series of Safety Seminars in which all teachers in all schools will participate. To that end, I've been gathering safety materials since the beginning of the term. Local industry has been most helpful in providing samples of safety booklets used in their plants. Lists of safety films have been prepared. The principals have discussed the importance of the problem, and we're almost ready to roll. However, plans will not be finalized until we have had a chance to hear from teachers as to what they think we ought to do to make these seminars productive toward cutting down accidents (rather than wait until after the seminars as to what we "shoulda done").

As of now, this is the general direction the Safety Seminars will take:

1. Each school will participate in at least two seminars during the school year.

2. These seminars will take place during the school day. Students will be dismissed at the Coe School only

*I notice that I've overworked the word "important" -- but safety IS!

at 1:00 p.m., November 27.*

3. Develop guidelines for student-made manuals specifically for each shop (and for other areas where accidents occur).

4. Analysis of previous accident reports and updating of reporting procedures.

5. Formation of an Advisory Committee for Shop and School Safety -- drawn from local industry.

6. Teacher activities during (and especially after) the first seminar. (This most important aspect is still in the planning stage, and your suggestions are welcome.)

... and that's where we stand at present. Will keep you posted.

****

FOUR TEACHERS SUBMIT PROPOSALS FOR MINI-GRANTS

If Fate (and the powers that be in Trenton) smile down on us, four of our teachers will be putting a little extra zing into their teaching soon.

They beat the October 30th deadline for submitting mini-grant proposals by a whisker when Karl Juelch made a special trip to the State Department Tuesday morning, 10/30, to deliver the last of our proposals.

All the proposals are interesting and innovative:

Austin Kosik's is titled "An Experimental Model Airplane Program to Motivate Low Achievers in Math". And if that $1,000 comes thru, his room will look more like a miniature airplane hangar than a math class. But underneath it all, there WILL be math. He's predicting that the experimental group of 9th graders involved in the program will do better in fundamentals on a standardized test at the end of the year than the control group.

In Walter Grzyb's Technical Drafting shop, he's hoping to get a multipurpose lathe so that students can actually make some of the parts they draw. The title of his proposal is "Enrichment of a Technical Drafting Course by Adding Model Making & Design".

Aubry Wilson, the new horticultural teacher who is hoping to recruit a good group of beginning students when his shop is finished or even before -- has contrived a career awareness proposal. It will consist of a mobile unit

* Other schools will meet at other dates - to be announced.

complete with Soundslide Projector and a 4' x 4' daylight screen to be shown (hold on to your hat) in local junior high schools during the lunch periods! After the equipment is used for recruitment, he will be able to use the projector for individualized and group instruction -- if the proposal is funded, that is. The title: "Developing Awareness to Career Opportunities in Ornamental Horticulture With a Cafeteria Guidance Presentation".

And Jim Capizzi rewrote the proposal that was turned down last year and gave it a new slant that may just hit the reviewers right this time. In addition to asking for funds to build a Refrigeration Systems Simulator, he's planning to have his students write a trouble-shooting workbook to go with it.

****

HERE COME DE' JUDGE

I've just learned that John Mahan, Safety Advisor at the Coe School, was way ahead of one on this safety program bit (and I'm sure so have many others -- but I just haven't heard about it).

Anyhow, he got his safety court team off to a good start by scheduling a visit to the East Brunswick Municipal Court within a few days after school had started. All it took was a telephone call to the judge's secretary and the usual arrangements with the principal.

When Mr. Mahan and the Coe School safety court officials (consisting of the court president, VP, two court clerks and the sergeant-at-arms) arrived, they got the red carpet treatment. Judge Schneider's secretary escorted them to the judge's chambers, and for about 20 minutes he spoke to the boys about the duties and responsibilities of the court -- after which they took seats in the audience and watched the real thing in action.

According to Mr. Mahan, positive outcomes were noticeable when 25 cases were tried at the Coe School's first Safety Court. "Having a model of how a real court functions was just what the boys needed to bring their own court the serious tone a safety program should have", he said.

****

MOBILE UNITS ON THE MOVE

Joe Colombo, Special Needs Director, reports that the mobile units

have completed their first assignment.

Frank Viola's Evaluation Unit has left the Youth Center and is now at Highland Park High School where it will remain for four weeks; Tony Rozycki's Plastics Unit has left the Crossroads School in South Brunswick and is now at the Memorial School in Spotswood; Len Hustak and Bill Evans' Small Engine Unit has left Metuchen High School and is now at School #1, Jamesburg, Monroe Township; Gene Harvey's Typing Unit is scheduled to remain at the Coe School where it is serving the needs of graphic arts and nursing students.

Some comments from the locations served:

Francis Masi, Director of the Youth Center ... "Really inspired the youngsters ... very pleased with their accomplishments and proud of the certificate ... instructor great ... send more ..."

Ruth Samsel, Guidance Counselor, Crossroads School ... "Outstanding ... Many youngsters not in the program came to see what their classmates were doing. Wanted to know how they could sign up ... Kids who previously never spoke in class verbalized what they were doing in the mobile units."

Mr. Cohen, Principal of Metuchen High School, said, "Loved it ... Instructors great ... even came back to demonstrate trailers on Open School Night."

****

FIELD TRIPS

Jim Schofield's Commercial Art class got to see some of the most outstanding art work at the Advertising Directions '73 International Show at the Americana Hotel on October 25. He says that the bus buzzed with "Did you see and did you see ... did you see ..." all the way home.

Vince Masi took his kids to Atlantic City on the 24th where they saw baking equipment used in large scale production .., something they could never see in this area.

... and if there were other interesting field trips, I just haven't heard about them. So keep me posted.

****

SAFETY SEMINAR-WORKSHOP SERIES

SEMINAR #1 - Winter 1973

Middlesex County Vocational-Technical High Schools

Nov. 27 - 1:15 - 3:30 p.m. Coe School Teachers & Staff at East Brunswick
Nov. 28 - 1:15 - 3:30 p.m. N. B. Teachers & Staff at New Brunswick
Nov. 29 - 1:30 - 3:45 p.m. P. A. & Wdge Teachers & Staff at Woodbridge

Purpose

It is the purpose of these Seminar-Workshops to:

1. Discuss some of the ways that safety can be more effectively built into the curriculum.
2. Make recommendations for immediate activities and long range goals.
3. Implement the recommendations.
4. Evaluate the program at the end of a specified time.

Objectives

As a result of participating in Seminar discussions and workshop activities during the 1973-74 school year, it will be possible to demonstrate that:

1. The safety consciousness level of all school personnel and students has been raised.
2. There have been fewer accidents.

Program*

1:15 p.m.	Introductions	Dr. Cy Sommer, Program Coordinator
1:20 p.m.	Remarks	Dr. J. Henry Zanzalari, Superintendent
1:30 p.m.	Report From Our Insurance Company	Mr. Al Aalberg, Bollinger Representative
1:40 p.m.	Digest of Accident Reports, 1971-73	Dr. Cy Sommer
1:50 p.m.	Kick-off Activity: Student-made Safety Manuals in Shops and Classrooms & Discussion of Sample Format	
2:50 p.m.	Seventh Inning Stretch	
3:00 p.m.	Planning for Implementation	

a. Discussion of suggestions sent in by teachers
b. Coordination with Safety Court
c. Small group activities (Gym Teachers, Similar Shops, Classroom Teachers)
d. Bulletin Board Contests, etc.
e. .....
.....
z. .....

3:15 p.m. Summary of Seminar #1

a. Setting the Immediate Goals
b. Timetable for accomplishment of goals
c. Planning for Seminar #2

3:30 p.m. Close

* Nov. 29 Seminar at Woodbridge will start at 1:30 p.m. Schedule will run 15 minutes later.

Sources for Materials

1. National Safety Council
   425 N. Michigan Avenue
   Chicago, Illinois 60611

2. Bureau of Engineering & Safety
   (Mr. James O. Ross - 648-2104)
   100 Raymond Boulevard
   Room 419
   Newark, N. J. 07102

3. School Safety Advisor
   New Brunswick - Mr. Walter Grzyb
   Perth Amboy - Mr. Fred Novo
   Woodbridge - Mr. William Colucci
   East Brunswick - Mr. John Mahan

4. Occupational Safety & Health Administration
   Department of Labor
   Washington, D. C.

5. Office of Public Information
   National Institute for Occupational Safety & Health
   Room 10-A-22
   5600 Fishers Lane
   Rockville, Maryland 20852

6. American Vocational Association
   1510 H Street, N. W.
   Washington, D. C. 20005

Sample No. 4

Raising Students' Level of Safety Consciousness

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS

November 27, 28, 29, 1973

Teachers' Guide for Maximizing the Effectiveness of the Safety Booklet Project

Objectives of Students' Safety Consciouness Program

1. Fewer injuries to students.
2. Students' awareness that safety is a lifetime skill – to be acquired by practicing safety in school.

Problem: To involve every student in the Safety Program.

Suggested Solution: Have every student develop at least one Safety Booklet for any area in which injuries occur, namely:

Gym – indoors
Gym – outdoors
Shop
Corridors, stairs, lavatories, locker room
Bus
Classroom
Lab
Etc.

The sample booklet is merely a model. The less imaginative student will probably go no further than fill in the blank spaces. But the more imaginative student will take off from there and come up with something entirely different in size, shape, color – something that reflects his/her own talent (and the teacher's effectiveness in motivating him/her to discover and develop that talent). In either case, *involvement* is the name of the game, and we must settle for what we can get.

Some of the Mechanics of the Safety Program

Time: While safety is an on-going all-year program, the booklet-writing phase should not exceed two weeks –– one week for the preliminary activities of idea development, research, design, followed by the student's rough draft and final writing; and a second week for committee evaluation and rewriting of a composite to represent the group (or selection of the one best entry providing it meets the teacher's approval as the Safety Booklet for that class or shop).

Starting date for this activity in all schools – Monday, December 3
Completion date in all schools – Friday, December 14

People: All students and all teachers will be involved. But the success of the Safety Booklet Project will depend mainly on the full cooperation of shop teachers and English teachers. The project will start in the shops, but it is in the English class that most of the developmental work will be done. But we will all be involved. The gym teachers are key people, because it is in gym that students are prone to sustain injuries. If they wish, the art and drawing teachers can help students make their booklets more attractive; the math teachers can encourage the use of picture graphs to interpret statistical data; the librarian can assist them with their research. We can all be key people if we want to be.

Procedure:

a. Initially, the project will be introduced by the shop teachers on Monday, December 3.

b. The English teachers will take over after the shop teachers have introduced the project and emphasized its importance.

Rationale for the Procedure:

It is imperative that students be "sold" on these activities on their behalf. Therefore, an affirmative approach by all teachers is essential. Students should *want* to work on the booklet for *their* shops or *their* sport. (I don't know how to motivate them to want to work on a safety booklet for *their* corridor or *their* lavatory — but that's part of the problem.) And we, as teachers, should want to work with them toward making this a worthwhile learning activity, for in the final analysis, we have as much to gain as they by providing a safe environment.

The shop teachers will distribute the model booklet and the Student Information Sheet. It will be necessary to read and discuss the Information Sheet with each group of students so that they know what is expected of them.

Safety is too important a skill to be "squeezed in" to the course of study. And developing a booklet related to the chosen trade or a favorite sport or even "their" school is meaningful subject matter. It is therefore suggested that the Safety Booklet Project should be the dominant (if not the only) subject matter for all English classes for sufficient time to achieve at least the "awareness" objective. However, the actual time devoted to this project is totally at the discretion of the teacher.

It has been suggested that the total task be separated into two phases of one week each:

1. Idea development and initial writing;
2. Committee evaluation and rewriting of the final booklet.

It is entirely possible that only a classroom committee will be involved in the second phase and that the remainder of the class will return to previously scheduled subject matter — but again, this is entirely up to the teacher.

STUDENT GUIDE FOR WRITING AN EFFECTIVE SAFETY BOOKLET

The model booklet that was given is just that —— *a model.* It was designed by the Commercial Art students and printed by the Graphic Arts students to help you get started.

The booklet *you* design will probably look very different from the model. Your booklet will show what you would do if you were employed as a Safety Consultant and were given the assignment to design a booklet that would:

a. help cut down the number of injuries to students in this school (and remember that not all injuries are the results of accidents);

b. help other students learn the most important vocational skill of all —— SAFETY —— the only skill that lasts a lifetime. The only skill that will never become obsolete.

If your booklet is to help in cutting down injuries, it **will have to be read** by the students for whom you are writing it. Therefore,

a. It should be interesting.
b. It should be attractive.
c. It should be illustrated.

Remember, the model merely *suggests* some of the things you might want to include. But *you're* the boss. *You* make the final decisions as to what goes into *your* booklet. *You* make the decisions as to:

a. How many pages it contains.
b. The size of the pages.
c. Layout and design.
d. Whether to include illustrations or not, etc., etc.

And you don't have to be an artist to get illustrations into your booklet. You can cut them out of magazines or newspapers or comic books. You may even want to take some pictures with your camera.

Even the choice of subject area is up to you. You don't have to write a *shop* safety booklet if you don't want to. You can do a booklet on any *area* of the school curriculum, such as:

a. Safety on the basketball court.
b. Safety on the hockey field.
c. Safety on the bus.
d. Safety in the kitchen (home economics).
e. Safety in the gym locker room.

. . . on *any* area where injuries may occur.

And remember, too, that all of your teachers will be working with you this week, but your project must be handed in by Friday, December 7. At that time, it will be turned over to your Classroom Editing Committee for preliminary review.

Exactly what procedure will be followed from that point will be decided by your English teacher.

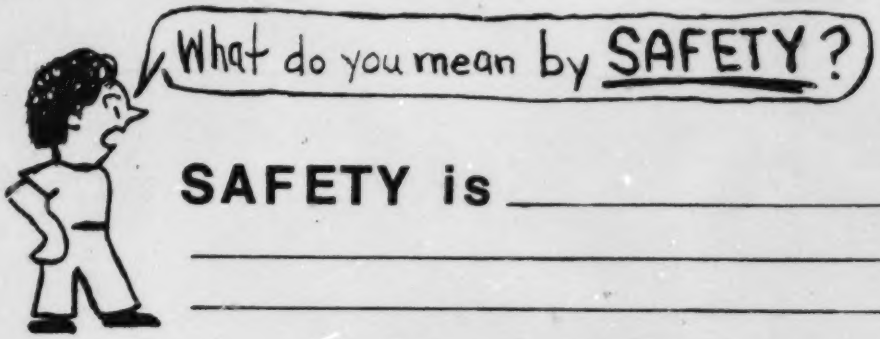
Your job is to put your best effort into this project and try to make a worthwhile contribution toward making your school a safe place to learn.

Additional suggestions:

Sample No. 6

A DO-IT-YOURSELF BOOKLET

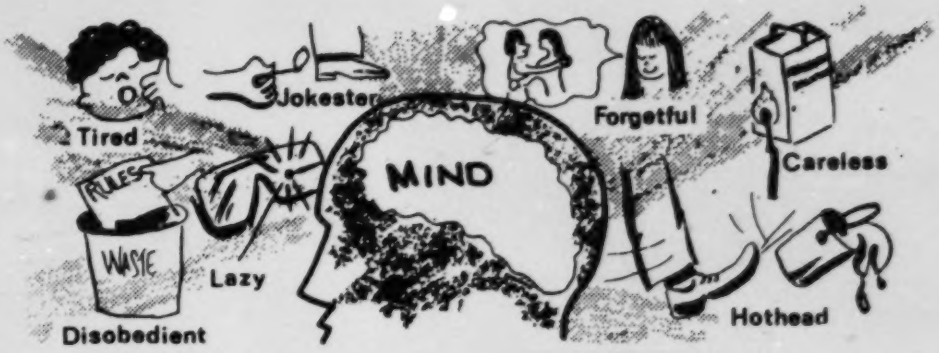
SAFETY AND WHAT IT MEANS TO YOU



SAFETY is _____

Most Common Accidents in _____

Q - What causes accidents?
A - Mostly it's somebody's STATE OF MIND



most often BROKEN RULES

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result:

Rule:

Result;

Safety DO'S

Unsafe DON'TS

SAFETY PLEDGE

1 _____ 15 _____

2 _____ 16 _____

3 _____ 17 _____

4 _____ 18 _____

5 _____ 19 _____

6 _____ 20 _____

7 _____ 21 _____

8 _____ 22 _____

9 _____ 23 _____

10 _____ 24 _____

11 _____ 25 _____

12 _____ 26 _____

13 _____ 27 _____

14 _____ 28 _____

Burr D. Coe Vocational & Technical High School

Middlesex County, New Jersey

This booklet was prepared by:

_____

_____

Safety Committee Chairman :

_____

Instructor: _____

SAMPLE OF EVALUATION FORM USED BY ENGLISH TEACHERS

1. Please list basic data for each class that you teach.

	1st Period	2nd	3rd	4th	5th	6th
a. Grade level	11th	11th	11th	11th		9th
b. Total number	12	22	22	32		38
c. Shops:	E	C & C	A.M.	P.		F-1
	D	ET	M.S.	S.M.		
				W.		

	1st	2nd	3rd	4th	5th	6th	Please do NOT write in the 3 columns below.		
2. Of the total number above, what % completed at least one safety booklet? (Estimate)	95	95	100	85	—	90			
3. What % appeared to be more involved in the activity than they usually are in classroom activities? (If none, write "0".)	90	90	100	85	—	95			
4. What % did more work at home than they usually do?	10	20	38	50	—	30			
5. How many days did the entire class work on the booklets?	5	5	5	5	—	5			
6. How many days were *interesting* days for the students?	5	5	5	5	—	5			
7. How many days were interesting for *you*?	5	5	5	5	—	5			

TO WHAT EXTENT:	Considerable	Somewhat	Not at all
8. Did you discover talents that you were unaware of?		x	
9. Did you have to "fight the kids" to get them to work on the booklets?			x
10. Would you say the Safety Booklet Project was a worthwhile involvement?		x	
11. Did this involvement help you to learn more of "relatedness" of instruction; i.e., what's going on in the shops or other areas of the school?		x	
12. Was the use of the model booklet an aid to you in getting students started?	x		
13. Did the model booklets inhibit creative activity?		x	
14. Did the model booklets "prime the pump" and encourage creative activity?	x		
15. Did you involve student committees in the evaluation of the booklets?		x	
16. If so, did this activity provide growth and enrichment opportunities for the students involved that they might not ordinarily have had in class?		x	
17. Did the Safety Booklet Project spark any creative ideas (by students) for future classroom activities?		x	
18. Did the Safety Booklet Project spark any creative ideas of your own for future classroom activities?		x	
19. To what extent did your involvement with this project stimulate positive professional discussion between:			
a. Members of your department?			
b. Yourself and shop teachers?	x		
c. Yourself and gym teacher?			x
d. Yourself and someone outside of school?		x	

TO WHAT EXTENT: (cont.)	Considerable	Somewhat	Not at all
20. What is your prediction with regard to this project's helping toward achieving our objectives:			
a. Fewer injuries?			
b. Lifetime safety consciousness?		x	
21. Did shop teachers stimulate student involvement in booklet activities?	x		
22. Did gym teachers stimulate student involvement in booklet activities?		x	
23. Did science teachers stimulate student involvement in booklet activities?		x	
24. Did math teachers stimulate student involvement in booklet activities?			x
25. Did you find this a more interesting two weeks than it might have been if you had been doing the usual thing?		x	
26. Was your preparation time increased?			x
27. To your knowledge, were any prizes offered in any of the shops?			x
28. If so, do you believe this had a motivational effect?		x	

Please feel free to add (and respond to) any questions that you think should have been asked.

4. Meeting Objective 6

> *"To continuously analyze all factors relative to the causes of accidents and injuries for the purpose of prevention."*

A system-wide analysis of all accidents and injuries was undertaken, and recommendations were made based on the findings. A summary of faculty suggestions for cutting down the number of accidents and injuries follows. (Sample No. 8)

SUMMARY OF SAFETY SUGGESTIONS

1. Include Safety as a report card grade.
2. Develop our own film library of safety films for the various shops.
3. Student safety committee to make weekly inspections of all machines, danger areas, etc. Keep report posted on bulletin board. Designate same time and day of week for inspection – such as Monday morning or Friday afternoon.
4. Have a separate section in the library, i.e., a "safety section" to which students can go to do assignments given by the safety court.
5. Have all teachers attend at least one session of the Safety Court each term.
6. Begin each term with Safety Week (after things settle down). Have contests, poster assignments, assemblies, speakers from industry, field trips to industry, etc.
7. To impress on students the importance of wearing their safety glasses – blindfold half of the students and have the other half guide them around the shop for 10 minutes (with the power shut off). Or some similar role-playing activity.
8. Include a monthly safety report on all shops in the Shop Newsletter.
9. Safety Court should distribute report of each court session to home room teachers, who should discuss this at an extended home room period.
10. Safety Committee should conduct periodic check of fire extinguishers and submit duplicate report to principal and safety advisor.
11. Establish a Safety Committee (advisory) along the lines of our other advisory committees. Membership on the committee would be composed of safety directors from industries located within the county.
12. There should be a "follow-up" on all accidents. There should be a student-teacher-principal conference regarding accident.
13. Install locks at the bottom of windows so that it will not be necessary to stand on chairs (Woodbridge).
14. Make a list of good Safety films to be shown to student body once a month at Safety Assembly. Suggested topics: (a) film on fires – to convince students of danger of smoking in restricted areas – and – (b) film on drinking and driving.
15. Ask shop teachers to write learning-task lists for teaching safety practices.

16. In addition to obtaining safety films, we should make some films of our own, utilizing our audio-visual equipment, e.g. videotaping in East Brunswick, motion picture filming, etc. Scripts could be developed by the English departments and shop teachers. Then the drama could be acted by the students. The involvement in making the films would teach safety, in addition to seeing the films at conclusion.

17. A list of students who have had accidents should be given to each shop teacher, together with a summary of the facts surrounding each accident.

18. Accident-prone students should be given extra supervision by the shop teachers.

19. "WALK! Don't Run!" signs in the corridors.

20. Develop a better code for giving safety tickets – one which prevents ticket-giving for asinine reasons.

21. Develop a student hall-patrol to be on duty at the end of each day.

22. Investigage the necessity of requiring safety shoes in certain shops – i.e., Welding, Air Conditioning and Refrigeration, Auto Body.

23. Teacher should be told if a child has brain damage, so she or he can deal with the safety problems that can arise involving machines.

24. A safety-council person should give instructions every year to teachers in how to use fire extinguishers, fuse boxes, etc.

25. The student medically excused from physical education should be permitted just to sit around in the gym or wherever the program is being conducted.

26. We should try to emphasize safe driving habits:
    a. to obey the speed limits.
    b. not to drag-race except at a drag strip.
    c. not to "burn rubber" when coming to or leaving school to impress the other students.

27. School bus safety
    a. loading
    b. unloading
    c. while traveling to and from school

28. School bus fire drills
    a. All students should be taught how to work emergency door and
    b. How to operate windows.

29. School buses – Do they carry fire equipment?

30. Fire drills in school
    a. Should be conducted when the students are somewhere other than in classrooms (auditorium, cafeteria).
    b. Students should be taught what exit to use in case the one they use on fire drills is closed off.

31. All fire-fighting equipment should be in working condition and checked to be positive they are full.

32. Never let anything burnable pile up near electric motors, ranges, ovens, or under stairways.

33. A-V equipment should not be returned to AV room or delivered while classes are passing.

34. Devise some kind of system to deal with those students who are constantly displaying disregard of safety rules in shop, class, halls, etc.

35. All vehicles left in shop overnight should have battery cables disconnected.

36. Never leave a vehicle on a lift (raised up) overnight.

37. Keep shop floors and corners clean at all times – and get rid of all excess junk.

38. "Wrong Way" signs at the front of the building, as cars coming from the rear enter the drive and travel in the wrong direction.

39. Paste-on instructions for operation of the various machines.

40. Hang safety goggles at the machine where their use is required.

41. Possibly a Safety Awareness Award certificate could be given to each student who goes through the senior year without receiving a safety violation ticket and who, in the opinion of the shop instructor, has exemplified a safety conscious worker.

42. Annual Shop Safety Award – A shop coverall or uniform with safety emblem (NSC) for each shop.

SHOP NEWSLETTER

Middlesex County Vo-Tech | January 8, 1974
Vol. 1, No. 4 | Cy Sommer, Editor

MANY OUTSTANDING BOOKLETS PRODUCED IN SAFETY PROJECT

Part One of the Safety Project is completed. According to a questionnaire distributed to the English teachers who are the real heroes of this project, more than 75% of our students completed individual booklets, and almost all of the teachers rated the project worthwhile.

Just before the Christmas vacation, the booklets were turned in to the principals who, in turn, turned them over to Mr. Juelch and Dr. Sommer who reviewed all of them. They, in turn, selected some of the outstanding booklets for Dr. Zanzalari. The remaining booklets have now been returned to the individual schools.

Since not all of the questionnaires distributed to the English teachers for their evaluation have been returned, a summary of the evaluations cannot be completed at this time. However, a tentative evaluation based on 60% of the returns indicates the following:

- Most classes worked on the Safety Booklet Project for seven days. Teachers felt that about 65% of the time spent was interesting to students and about 60% interesting to teachers.

- In response to the question "Did you have to 'fight the kids' to get them to work on the booklets?", 20% of the teachers replied, "Not at all". However, 18% said they had to fight the kids "considerably". The remaining teachers did not think it was too much of a hassle.

- When asked if the project sparked any ideas for future classroom activities, 60% of the teachers said that it did.

- In response to the question as to whether the project increased prep time, 40% said it did not increase prep time at all; 60% said it did.

- As to whether teachers found working on the project more interesting than if they (the teachers) "had been doing the usual thing", 60% said it was more interesting.

When all the returns are in and a complete evaluation is made, it will be interesting to learn whether there is any correlation between how interesting the teachers find their classroom activities and how much preparation they put in; for in the final analysis, the name of the game is survival -- and if one of the keys to survival in the classroom is to make your teaching interesting to yourself, (and if there is a positive correlation between interest and preparation) the implication is clear ...

- - - -

Part Two of the Safety Program will take place in the spring with another released time half day. Suggestions for the agenda are welcome as we have no specific plans at the present time. In other words, NOW is the time to feed YOUR ideas into the problem of how to cut down the number of injuries to students.

Admittedly, Part One came as a surprise to many teachers and planning was pretty one-sided. Even so, a great many good ideas were suggested for the 1974-75 Safety Program. These were suggested by Bob Krebs and Jean Dvorak (EB):

1. Prepare safety "commercials" to be presented over the P. A. system.

2. Have students create a safety cartoon character (e.g., Smokey the Bear) and plan a campaign around him.

3. Prepare a safety advertising campaign -- magazine ads, posters, commercials.

4. Create poems to illustrate safety ideas.

- - - -

The suggestion made by Larry Sforza and Tom Little (NB) that we formalize the Safety Booklet Project for freshmen seems like a good idea also -- particularly since we have a supply of booklets left and the procedures are already established. In regard to the booklets, it's impossible to fully express our debt to Jim Schofield and Harold Greene (EB) for the design and printing of the booklets

without which the entire project would not have been possible. Who knows but what fingers or eyes might have been saved. . .

* * * * *

AUBRY WILSON AWARDED MINI-GRANT FOR CAREER AWARENESS PROPOSAL IN ORNAMENTAL HORTICULTURE

Of the four mini-grant proposals that were submitted to the State Department, one came thru: Aubry Wilson's proposal to bring to junior high school students awareness of the many career opportunities in ornamental horticulture and floriculture via a 3M Soundslide presentation.

Two aspects of the proposal are unique: (1) The entire presentation is mounted on a mobile cart with a large rearview screen so that the entire presentation is self-contained. (2) The mobile cart is to be brought to sending schools and left there for a week. It will be stationed in a corner of the lunchroom (!!!) The teacher on duty will merely have to flick the switch to start the 15-minute program.

Aubry is well aware of the noise in lunchrooms. So is the State Department. But they're gambling on the fact that most students finish lunch in about three minutes and may amble over out of curiosity. It will be no more difficult for them to get the message than it is for people who stop in front of a slide presentation at the Teachers' Convention.

As for the teachers whose proposals did not make it this time, maybe next year . . . In any event, they made a good try and are to be commended. So, Austin Kosik (EB), Walter Grzyb (NB), Jim Capizzi (EB) -- better luck next time. And if other teachers are interested in writing a proposal for a mini-grant next year, talk with any of the men who have been thru the mill. Then, if you think I can be of any assistance, don't hesitate to call on me.

* * * * *

WOULD YOU LIKE A TIME CLOCK IN YOUR SHOP?

From time to time, I've heard shop teachers express the desire to have time clocks installed in their shops. It's just possible that they may get their wish . . .

I've been speaking to a manufacturer of time clocks and proposed that we do a pilot study to determine if a time clock can be

made to function as an instructional tool rather than just a frill to make a school shop look like a shop in industry. They are anxious to provide us with the clocks without charge to test the hypothesis that "a time clock can be used to improve shop organization and instruction"

While the clock itself will only punch the time, there is space on the card for a great deal of other information, much of which can be recorded by the student himself. At the same time, it can simplify the teacher's record-keeping chores. For example:

a. Daily Grade: The student brings the card to the teacher at the end of the session; the teacher records the grade; the student then replaces the card in its slot. The value lies in immediate feedback and reinforcement for the student and simplification of report card work.

b. Time Out of Shop: The student himself does the work of summarizing at the end of the week or marking period.

c. Record of Assignments: The actual job assignments can be summarized on the card by the student daily.

d. Production Record: The actual time spent on a job or task can be kept track of automatically. (A student can have more than one card: one color for attendance, another color for a specific job, start to finish.)

There must be many more ways in which the time clock can be made to function as an instructional tool. Teachers are encouraged to design the card to record the information that meets their needs. If you are interested and would like to have a time clock in your shop, get in touch with me. A note in my box will do.

There are no strings to this offer. You only have to be interested enough to try to come up with innovative ways to make your shop a better place in which to learn and a happier place in which to teach.

* * * * *

NEW SCHOOL PLANNING UNDER WAY

Mr. Boylan is bringing together the ideas of teachers, consultants, and architects for the new school.

The teachers' ideas are most important. So, if you'd like to see your ideas become reality, stop in to see Mr. Boylan today -- or call him at 257-3300 -- or ask Dr. Sommer for an outline of the space allocated to the shop in your area so that the plans can be finalized before March 1.

CHAPTER III
STATEMENTS OF GENERAL POLICIES
FOR THE SAFE OPERATION OF VOCATIONAL COURSES

The Board recognizes its responsibility in providing the safest conditions for its employees and pupils. Educational production and safety are inseparable. The effectiveness of the District instructional program is in large part determined by an environment free from disruptions to the learning process. A loss of educational production is the ultimate result of an employee or pupil accident or illness. Accidents resulting in personal injury and damage to property and equipment represent needless waste.

A. It shall therefore be the policy of the Board to take all practical steps to safeguard employees and pupils from accidents and to maintain at all times an effective safety organization.

B. Effective supervision of pupils shall remain in force whenever pupils are on campus or under supervision of school personnel. Pupil safety shall be an integral part of the curriculum at all grade levels and in all subjects.

The Board recognizes the Occupational Safety and Health Act of 1970 and associated state legislation to be appropriate to and consistent with the purposes of the District. The application of federal and state standards for working conditions, structural limits and acceptable work practices shall be continuous and an integral part of the District organization.

The Superintendent shall hold each employee responsible for the maintenance of a safety program.

POLICIES

BOARD OF EDUCATION
MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL SCHOOLS

	File
Accidents/First Aid	JGFG/JGFGA
Alcohol Use	JCDAB
Behavior Code	JCDA
Bomb Threats	JGFF-C
Buildings and Grounds	JGFF-B and EBBF
Bus Conduct	EDCB
Communicable Diseases	JGCC
Dealing with Potential Disorders	JCE
Dismissal Precautions	JGFC & JGFC-R
Drug Use	JCDAC
Emergency Drills	JGFA (also EBBC)
Eye Protection Devices	JGF Revised
Indemnification Agreement	KG-E (3)
Inoculations	JGCB
Medicines	JGCD
Safety	EDC
Safety Council Chairperson	GBRE(8)
Smoking	JCDAA
Student Automobile Use	JGFF
[illegible]ent Bicycle Use	JGFF-A
Student Health Services	JGC
Student Insurance Program	JGA
Student Physical Exams	JGCA & JGCA-R
Student Safety	JGF and JGF-R
Student Safety Patrols	EDC
Student Transportation Safety	JCDAD

Files: JGFG/JGFGA
(Cf. JGC)

ACCIDENTS/FIRST AID

A school nurse or other assigned staff member shall be responsible for providing emergency services in case of injury to, or sudden illness of, a student or staff member.

At each school, procedures shall be developed and made known for the proper handling of such emergencies.

These shall incorporate the following requirements:

1. The school nurse or another trained person shall be responsible for administering first aid, except for very minor injuries.

2. In all cases where the nature of an illness or an injury appears in any way serious, every effort shall be made to contact the parent and/or family physician immediately.

3. No student who is seriously ill or injured shall be sent home alone, nor shall a student who is ill or injured be taken home unless someone is there to receive him.

4. In extreme emergencies, the school nurse/school doctor/or principal may make arrangements for immediate hospitalization of injured or ill pupils, contacting parent or guardian in advance if at all possible.

5. The teacher or other staff member to whom a student is responsible at the time of the accident shall make out a report on an official form providing details about the accident. This shall be required for every accident.

6. Accidents requiring medical attention shall be reported as soon as possible to the superintendent and the Board.

The Board shall be responsible only for providing immediate first aid. All other medical care, and financial responsibility for it, is the obligation of the student or his parents or guardian.

File: JCDAB (Cf. JC, JCD, JD, JDD)

ALCOHOL USE

The use of, as well as the possession of, any form of alcoholic beverages is prohibited on school property at all times.

Anyone suspected of having used intoxicating beverages may be excluded from school at the discretion of school authorities and is subject to disciplinary action.

File: JCDA

BEHAVIOR CODE

Students will behave themselves according to the laws of the State of New Jersey as applies to them as well as the rules and regulations of the Board of Education and the individual school attended. The code is based on a respect for the health and safety and welfare of each individual as well as the health, safety, and welfare of the entire student body and school community.

BUILDINGS AND GROUNDS

No student is allowed to leave the school grounds during lunch time, as it may mean suspension or dismissal from school. Due to reasons of safety it is impossible to eat lunch outside of school in 26 minutes.

Any student found in the gym when not in a regularly scheduled Physical Education class under the direction of an instructor will be issued a Safety Ticket. Unsupervised gym activities are UNSAFE activities.

Students know that it is unauthorized to play sports by themselves or any other group activity without the supervision of a certified instructor. Students playing basketball, baseball, etc. during lunch periods and other times without adequate supervision jeopardize themselves. Please do not bring basketballs, footballs or any other implements used in sports activities. Gym instructors supply sports equipment and supervise game activities according to an approved schedule.

Students who want to be in class or shop all day and/or have parental permission slips for appointments, etc., must process the release forms (getting signatures from teachers concerned) between 8:45 and 9:00 a.m. each day. Our office will *not* process these forms during the day after 9:00 a.m. Emergency cases will be done by the school nurse.

Students 18 years or older will be given the accommodation of a "courtesy call" to parent.

Students are to be released one at a time for rest rooms, errands, etc., with a bonafide pass signed by the releasing teacher. The next student does not go until the other returns. When the office calls for individuals, render a pass for them also. One student out at one time.

All shop teachers must make sure that all power is *"off"* in the shops when leaving at night.

BUILDINGS AND GROUNDS SAFETY INSPECTIONS

The principal of each school shall be responsible for making quarterly safety inspections of the building during the year, with reports to be submitted on the first of October, January, April, and July. The inspections should be made personally by the principal, with the assistance of the head custodian.

It is the principal's responsibility to identify unsafe conditions and ask for corrections.

C_

File: EDCB

BUS CONDUCT

A teacher or other person in authority over such pupil shall hold every pupil accountable for disorderly conduct in school and during recess and on the playgrounds of the school and on the way to and from school. (LEGAL REF.: 18A: 25–2)

FILE: JGCC

COMMUNICABLE DISEASES

Students who have been excluded from school because of a communicable disease cannot be readmitted without written statement from a physician certifying that there is no danger of the student communicating the disease to others. (LEGAL REF.: 18A: 40–10)

BOMB THREATS

When the principal is made aware of the possible existence of a bomb in the building, the students should be immediately evacuated in the same manner as that of a fire drill. If the information is received over the telephone, all personnel should use the following procedure:

1. Keep the caller on the line as long as possible. Send someone to another telephone to trace the call. Record the message if possible.

2. If the caller does not indicate the location of the bomb or the time of possible detonation, the person receiving the call should ask the caller to provide this information.

3. It may be advisable to inform the caller that the building is occupied and the detonation of a bomb could result in death or serious injury to many innocent people.

4. Pay particular attention to any strange or peculiar background noises such as motors running, background music and the type of music, and any other noises which might give even a remote clue as to the place from which the call is being made.

5. Listen closely to the voice (male-female), voice quality, accents and speech impediments. Immediately after the caller hangs up, the person receiving the call should report this information to the principal.

6. The information should then be reported immediately to the Superintendent and the police department.

7. Immediately alert the principal to start the bomb inspection.

8. Sound the fire alarm and evacuate the building.

9. When the police department or fire department notifies the school of a bomb threat, notify the princpal. He should then follow steps 6, 7 and 8.

DEALING WITH POTENTIAL STUDENT DISORDERS

It would be a gross error to assume that student disorders could not happen here. Therefore, the following steps shall be taken to develop an atmosphere and climate which would help all concerned to understand the social problems and tensions of our times.

A. Disturbance originating outside the school

1. All visitors to the school shall be required to report to the principal's office for a visitor's pass. Unauthorized persons shall be directed to the principal's office. The principal shall be sent for if necessary.

2. Decision with respect to the visitor or visitors is at the discretion of the principal.

3. If visitors refuse to obey the principal's directive, the local police shall be called.

4. If an individual or group creates a disturbance on school property, so as to interfere with school program, police shall be called.

5. If outsiders attempt to enter the building for purpose of creating a disturbance, these procedures and guidelines shall be followed:
   a. The principal will be notified immediately, and students will be retained in their classrooms and shops.
   b. If principal feels that serious trouble is possible, s/he will call the police.
   c. In any case, students must be protected from harm, and every effort must be made to prevent their involvement.
   d. A full report will be made to the superintendent, who in turn will notify the county superintendent.

B. Disturbance originating within the school

1. The principal shall be notified, and s/he shall investigate at once.

2. If the principal feels that the situation might get out of hand, s/he shall notify the superintendent.

3. In the meantime, teachers shall attempt to control the individual or group causing the disturbance.

4. The administration and staff shall isolate, if possible, those who are causing trouble, and keep uninvolved students away from trouble spot.

5. The "trouble-makers" shall be brought together, and an attempt shall be made to find the source of the trouble and get at the root causes of the problem; the administration will listen to their grievances.

6. As last resort, the police shall be called.

7. In case of extreme danger to students and teachers, the school shall be dismissed upon approval of the superintendent.

C. In case of *rumors* concerning possible serious disturbances by outsiders or from within the school, the following steps shall be taken:

1. The superintendent shall be informed of the rumor, and advised of steps planned to be taken.

2. The principal shall meet with the faculty for the purpose of running down the rumor.

3. If it appears that trouble may be expected, teachers shall be alerted and assigned surveillance of specific points of entry to building and key points within the building.

4. Every effort shall be made to avoid spreading rumors; at this point students shall be involved no more than absolutely necessary.

5. If a widespread rumor has been determined to be entirely false, then all students may be given the truth.

File: JGFC–R

DISMISSAL PRECAUTIONS

Early dismissal may be authorized students when the parent/guardian makes the request for a valid purpose and calls for the student at the school office.

Students are not to be sent on errands by the school staff, requiring them to leave the campus.

Early Dismissal for Illness

A student who is ill may be sent home if a parent or guardian or other responsible adult calls for him or her at the principal's or nurse's office.

If parent or guardian cannot be reached and student is too ill to return to class, s/he must stay in nurse's office until dismissal time, and then shall be taken home by the school nurse or other designated responsible adult.

An ill student who has come to school with his/her own transportation and is not too ill to drive home, may do so with permission of principal and parent or guardian. The parent or guardian shall be requested to notify the principal's or nurse's office when student has arrived home.

File: JGFC

DISMISSAL PRECAUTIONS

Once a high school student has entered school grounds, s/he may not leave until the end of the school day, except as authorized to do so by the school administration.

This administration shall give authorization only for valid reasons. (LEGAL REF.: 18A: 25-2)

File: JCDAC (Cf. IDB)

DRUG USE

The emotional and physical welfare of the school child is a primary concern of the Board of Education of the Vocational Schools in the County of Middlesex. Actions school personnel take with suspected drug-abuse cases must be based on this principle. Therefore, when a student exhibits abnormal behavior or a physiological change that may indicate drug abuse, the building principal is authorized to advise and/or enlist the aid of the following authorities and services:

The child's parents or guardian
Juvenile authorities
Hospitals, rescue squads, and physicians
Guidance counselors and/or school nurse
Clergy
Other pertinent agencies

Any known infraction of legal statutes shall be reported by the principal to the parents and authorities. If the parents, after reasonable effort, cannot be located, the authorities will be notified without undue delay. (N.J. Law: Chap. 390, 414 – 1971. Assem. Bills: 1097,744)

File: JGFA (Also EBBC)

EMERGENCY DRILLS

Fire drills shall be held at least twice each month, as required by state law. The principal of each school will be responsible for developing fire-drill procedures for the building, in line with general regulations covering all schools.

Civil defense drills shall be conducted periodically.

The principal shall include in the monthly report the dates fire drills were held. (LEGAL REF.: 18A: 41-1)

REVISED STATEMENTS FOR USE OF EYE PROTECTION DEVICES*

Auto Body:

Clear spectacles with side shields or goggles must be worn when observing, aiding or performing all grinding, soldering and chipping operations. Also when handling thinners, paints, solvents or toxic materials.

Proper welding goggles are to be worn when observing, aiding or performing welding operations.

Auto Mechanics:

Clear spectacles with side shields must be worn when eye-hazardous operations are being performed or observed. Also when in the area where such activity is taking place.

Face shields are to be worn when observing, aiding or performing operations using the Steam Jenny.

Carpentry & Cabinetmaking:

Clear goggles are to be worn at all times when observing, aiding, or performing operations utilizing portable or stationery machines, and when the danger of flying objects exists.

Face shields must be worn when grinding, lathe turning, and handling caustic liquids.

Diesel Truck Mechanics:

Same as for Auto Mechanics.

Electrical Trades:

Clear spectables with side shields are to be worn at all times when observing, aiding, or performing operations utilizing heavy or portable machines; when soldering; and when the danger of flying objects exists.

Clear goggles are to be worn at all times when observing, aiding, or performing operations using soldering equipment.

Electronics:

Clear spectacles with side shields are to be worn at all times when observing, aiding, or performing the task of removing or installing a picture tube.

* Eye Protective Devices (referred to as "Goggles" or "Spectacles") must meet NIOSH standards.

Employment Orientation:

Clear goggles are to be worn at all times when observing, aiding, or performing operations utilizing portable or stationery machines, and when the danger of flying objects exists.

Clear safety goggles with side shields are to be worn when observing, aiding, or performing welding or soldering operations.

Face shields must be worn when grinding, lathe turning, and handling caustic liquids.

Graphic Arts:

Clear goggles are to be worn at all times when observing, aiding or performing operations using the composing-room saw.

Machine Shop:

Clear spectacles with side shields are to be worn at all times when the shop is in operation.

Dark eye shields must be worn in the furnace room.

Ornamental Horticulture:

Clear goggles are to be worn at all times when observing, aiding or performing operations utilizing heavy equipment and machines. Also when danger of flying objects exists and when using chemicals, toxic spray, or dust.

Painting & Decorating:

Clear goggles are to be worn at all times when observing, aiding, or performing the operations utilizing portable machines.

Clear, full-length face shields are to be worn at all times when observing, aiding, or performing the task of removing and installing glass.

Clear, splash-proof goggles are to be worn at all times when observing, aiding, or performing operations which involve the use of caustic or explosive chemicals.

Plumbing:

Clear spectacles with side shields are to be worn at all times when shop is in operation except as noted below:

> Clear goggles are to be worn at all times when observing, aiding, or performing operations dealing with molten metals.

Sheet Metal:

Clear spectacles with side shields are to be worn at all times when observing, aiding, or performing operations using heavy or portable machines.

Clear goggles are to be worn at all times when observing, aiding, or performing operations using soldering equipment.

Upholstery:

Clear goggles are to be worn at all times when observing, aiding, or performing operations using heavy or portable machines with the exception of the sewing machines.

Clear, splash-proof goggles are to be worn at all times when observing, aiding, or performing operations which involve the use of caustic or explosive chemicals.

Welding:

Safety goggles with side shields or flash goggles are to be worn at all times when the shop is in operation.

Clear safety goggles are to be worn at all times when observing, aiding, or performing all welding operations, including chipping, chiseling, brushing, grinding, and drilling; also electric arc welding and oxy-acetylene welding.

Other Shops Such as Architectural & Technical Drafting, Baking, Beauty Culture, Commercial Foods, Fashion Design, and Practical Nursing:

The need for eye-protective equipment is sufficiently infrequent so as not to require a special mention. If, however, conditions in these shops change so that eye protection is required, it will be provided.

Science Laboratories:

Clear, splash-proof goggles are to be worn at all times when observing, aiding, or performing operations which involve the use of caustic or explosive or poisonous chemicals.

BOARD OF EDUCATION OF THE MIDDLESEX COUNTY VOCATIONAL SCHOOLS
Administration Offices: 112 Rues Lane, East Brunswick, New Jersey 08816

INDEMNIFICATION AGREEMENT

In consideration of the Board of Education's granting permission to the organization to use the Board's premises as set forth in the application, said organization hereby agrees to indemnify the Board not only against any claim or loss to persons or property resulting from its use of the premises, but also to indemnify the Board against the costs, including legal fees, of any lawsuit, whether said suit is successful or not; and this Contract of Indemnification is a condition to approval of the organization's request to use the premises.

DATE: _____ NAME OF ORGANIZATION:

WITNESS: _____

_____ Name and Title of Person Authorized to Contract for the Organization:

_____

SIGNATURE: _____

File: JGCB

INOCULATIONS

The state School Health Services Guidelines recommends that polio and diphtheria inoculations be required.

Local school districts shall be required to furnish the Superintendent with the proof and record of each student's inoculation against polio and diphtheria.

File: JGCD

MEDICINES

Diagnosis and treatment of illness and prescribing of drugs and medications are not the responsibility of the school.

Recommended policy:

1. The school should not provide student with aspirin or any other medication.
2. Diagnosis or treatment beyond first aid procedure is not usually the responsibility of the school and is illegal by non-medical personnel.
3. The administration of medication to pupils shall be done only in exceptional circumstances wherein the child's health may be jeopardized without it.
4. Pupils requiring medications at school must have a written statement from the family physician which identifies the type, dosage and purpose of the medication.
5. Written statements from the parents giving permission to give medication prescribed by the family physician should be required by the school.
6. The school physician must approve any request from a family physician that medication be given a student.
7. The school physician should be advised of any drug being taken by a child attending school, particularly those which might cause a change in behavior.

SAFETY COUNCIL CHAIRPERSON

Job Description

Responsible for establishing and promoting the school safety program.

Duties and Responsibilities

1. Organize and supervise a teacher-student committee which periodically examines all school facilities for the existence of hazardous conditions.

2. Guide students in the writing of reports detailing specific recommendations arising out of committee inspections. Reports are to be submitted to the teachers and students responsible for the area and the school administration.

3. Schedule follow-up inspections to determine if recommendations have been implemented.

4. Organize and supervise a student safety court which conducts hearings on individual safety violations.

5. Follow Board of Education and school policies regarding the safeguarding, depositing, and reporting of any monies generated or processed by the organization or activity.

6. Promote school-wide safety by planning and implementing on-going student and faculty involvement by such means as contests, displays, films, freshman safety orientation and similar activities.

7. Evaluation by the principal shall be specific for each of the duties and responsibilities listed in the job description.

Term of Assignment

Coincides with the teachers' contractual year, September 1 – June 30.

Evaluation

By the principals, based on the satisfactory performance of duties and responsibilities. A written report of the year's activities must be submitted to the Superintendent through the principal by the person holding this position at the end of the school year.

Remuneration

As per agreement in effect between the Board of Education and the Middlesex County Vocational and Technical High School Teachers' Association.

File: EDC

SAFETY

It shall be the policy of the Board of Education to promote student safety on buses and to encourage all safety practices that will lead to the safety and well-being of students en route to, in, and returning home from our schools.

File: JCDAA

SMOKING

Smoking is permitted, but not encouraged or endorsed, before and after school, and during lunch break, only in specified areas approved by the principal.

File: JGFF

STUDENT AUTOMOBILE USE

Parking on school property is a courtesy extended students and others by the Board of Education.

The administration will establish rules and regulations for the safety of all persons using school lots and for the maximum protection of the vehicles. However, the district shall assume no responsibility for damage to cars or for the theft of cars or articles from cars.

Permission to park on school property may be rescinded by the administration for any person who does not observe the regulations.

File: JGFF-A

STUDENT BICYCLE USE

Parking on school property is a courtesy extended students and others by the Board of Education.

The administration will establish rules and regulations for the safety of all persons using school lots and for the maximum protection of bicycles. However, the district shall assume no responsibility for damage to bicycles or theft of bicycles.

Permission to park on school property may be rescinded by the administration for any person who does not observe the regulations.

File: JGC (Cf. JGFG)

STUDENT HEALTH SERVICES

Health services at each school shall be provided by a school nurse and a medical inspector. Medical inspectors shall be appointed by the Board for the particular school.

The medical inspector shall give those physical examinations to staff members and students which are required by law or by the policy of this Board. (LEGAL REF.: 18A:40 et. seq.)

File: JGA (Cf. EBG)

STUDENT INSURANCE PROGRAM

The district shall arrange to make inexpensive insurance available to students covering injuries received in event of accident at school, on the way to and from school, and while engaging in supervised school activities; or insurance providing round-the-clock coverage. Purchase of the insurance shall be voluntary on the part of students and their parents, but it shall be recommended. The cost of this insurance shall be borne by the student.

The school district shall insure all students who engage in interscholastic athletic events. (LEGAL REF.: 18A:43-1, 2, et. seq. 18A:43-3-No Liability by School)

File: JGCA

STUDENT PHYSICAL EXAMINATIONS

All 9th and 11th grade students at the Middlesex County Vocational and Technical High Schools shall be required to have a physical examination by the school physician at the beginning of each school year. If for any reason the parent or guardian wishes that the student have this examination made by the family physician, a certificate of said examination shall be submitted within an interval established by the administration.

Additionally, all students engaged in interscholastic athletics shall have a physical examination by the school medical inspector.

Each student shall be screened for tuberculosis in grades 9 and 12, as required by State Board of Education regulations. The method used for screening shall be in line with State Board recommendations and that specifically recommended by our school physicians. Positive reactors to the screening test shall be given a chest x-ray at no cost to the student.

Additional TB tests and/or physical examinations may be required for enrollment in certain programs. All those tests required by this district or by the State for practical nursing students and food handlers, for example, shall be given at district expense. (LEGAL REF.: 18A:40 et. seq.)

File: JGCA–R

STUDENT PHYSICAL EXAMINATIONS

Students whose annual physical examination is made by their personal physician shall submit the certificate of the examination to the school nurse no later than the first week of September.

STUDENT SAFETY

Instruction in shops and laboratories shall include and emphasize safety and accident prevention.

Objectives of safety instruction in shops shall be as follows:

To help students —

1. Learn how to work safely and how to prevent accidents.
2. Learn how to care for equipment so as to reduce the possibility of accidents.
3. Develop habits of good housekeeping, proper storage and handling of materials, and sanitation.
4. Become familiar with personal protective devices and the proper clothing to be worn for safety purposes.
5. Develop skills in the safe use of tools.
6. Learn how to cooperate with others in the promotion and operation of a safety program in a school shop.

Safety instruction shall precede the use of materials and equipment by students in shops, and instructors shall teach and enforce all safety rules set up for the particular shop program.

Eye-Safety Devices

The law states:

> The board of education of every school district shall require each pupil and teacher in public schools of the district to wear industrial-quality eye-protective devices while attending classes in vocational or industrial arts shops or laboratories in which caustic or explosive chemicals, hot liquids or solids, hot molten metals, or explosives are used, or in which welding of any type, repair or servicing of vehicles, heat treatment or tempering of metals, or the milling, sawing, stamping or cutting of solid materials, or any similar dangerous process is taught, exposure to which might have a tendency to cause damage to the eyes. Visitors to such classrooms or laboratories shall also be required to wear such protective devices. The commissioner of education, by rule or regulation, shall prescribe the kinds, types, and quality of such protective devices, and in so doing, the commissioner shall be guided by the standards promulgated by the American Standards Association, Inc., for such protective devices.

The administration shall establish, and the Board shall approve, eye-safety regulations in line with State law, rules, and regulations.

The Board shall purchase the basic eye-protective devices needed in all shops and laboratories, but the purchase of prescriptive glasses for eye protection shall be the responsibility of the individual. (LEGAL REF.: 18A:40-12.1 and 40-12.2)

File: JGF-R

STUDENT SAFETY

We should never relax our efforts toward the maintenance of safe shops, laboratories, and classes. Safety is everyone's responsibility. Therefore:

1. All employees of the school system shall report any unsafe equipment, tool, or practice to the principal.

2. Each shop instructor and **each related science teacher** shall develop a set of general safety rules for his/her shop or laboratory, and **specific rules for each machine, process, or piece of equipment used to instruct pupils.**

   The general safety rules for each shop and the specific safety rules for each machine should be carefully prepared and either be mimeographed or printed. Each instructor requiring such safety rules should have sufficient copies available for each student, and copies shall be posted.

3. No pupil shall be permitted to work in a shop or laboratory until s/he has been instructed in the general safety rules, and no pupil shall be permitted to operate a machine, use a piece of equipment or hand tool, or conduct an experiment until s/he has received proper safety instructions concerning the particular equipment to be used.

4. The **principal shall arrange for sufficient** inspections during the year of such things as electrical extension cords, motor connections, machine safety guards, portable equipment and tools, ladders, goggles, hand tools, etc., so that they are always safe to use. The inspection of the major equipment in a shop shall be conducted by the principal and the teacher of the shop being inspected.

5. There are times when a teacher must leave the shop or classroom either for personal reasons or in the performance of duties as assigned by the principal. The general rule to follow is to not be out unless necessary. If it is necessary for the teacher to leave the shop or classroom, s/he shall shut off all power to machines or equipment which may be hazardous for pupils without supervision.

6. It is recommended that each school have a functioning **Student Safety Council** made up of at least two students from each shop class. The students should be selected by the shop teacher and should assist him/her in keeping the shop safe.

   One of the two students should be selected as delegate and the other as alternate to a Student Safety Council. This should have officers and which should meet at least **once a month,** with a faculty adviser, for the purpose of working out programs for making and keeping the school a safer place.

   The secretary of the Student Safety Council should keep accurate, legible **minutes and accurate monthly records of accidents by shops.**

7. At least two assembly programs per year should be devoted to safety.

Eye Protection Devices

The following regulations shall apply to all students, employees, and visitors to school shops and laboratories.

1. Proper eye-protective devices shall be required for any activity being conducted in the instructional program where exposure might have a tendency to cause damage to the eyes.

2. The school will purchase the basic eye-protective devices needed for all shops and laboratories.

3. Pupils and teachers shall be encouraged to purchase their own glasses, through the school, if prescription glasses are needed.

4. Prescription glasses must meet the specifications set forth by the American Standards Association, Inc.

5. All pupils, employees, and visitors shall be required to wear eye-protective devices in designated "eye-protective areas" while the shop or laboratory is in operation.

6. Each visitor will be provided with the proper eye-protective device. Visitors to a specific shop or laboratory designated as an "eye-protective area" will be provided with eye-protective devices in the respective shop or laboratory. Visitors to more than one shop or laboratory designated as eye-protective areas will be provided with eye protective devices in the principal's office.

7. As recommended by the school physicians, aqueous zephiran hydrochloride, 1:750, should be used as the disinfectant for eye-protective devices when needed.

8. An adequate inspection program will be developed in each school to detect eye hazards.

9. Inspections of eye-protective devices will be made by shop laboratory instructors.

10. The pupil will be held responsible for the care and return of any eye-protective device issued to him/her.

11. Instruction concerning the use of eye-protective devices will be required in the shop and laboratory course of study outlines.

12. Instruction concerning the use of eye-protective devices will be required in the health course of study outlines.

13. The shop or laboratory teacher will be responsible for the enforcement of rules concerning eye-protective devices as they pertain to the specific shop or laboratory.

File: EDC

STUDENT SAFETY PATROLS

It shall be the policy of the Board of Education to promote student safety on buses and to encourage all safety practices that will lead to the safety and well-being of students en route to, in, and returning home from our schools.

File: JCDAD (Cf. EDCB)

STUDENT TRANSPORTATION SAFETY

A teacher or other person in authority over such pupil shall hold every pupil accountable for disorderly conduct in school and during recess and on the playgrounds of the school and on the way to and from school.

The driver shall be in full charge of the school bus at all times and shall be responsible for order. The driver shall never exclude a pupil from the bus, but if unable to manage any pupil, shall report the unmanageable pupil to the principal of the school which the pupil attends.

A pupil may be excluded from the bus for disciplinary reasons by the principal. During the period of such exclusion, the parents shall provide for the pupil's transportation to and from school. (LEGAL REF. 18A:25-2A)

CHAPTER IV
SPECIFIC STATEMENTS OF PRACTICES AND PRECAUTIONS REQUIRED FOR SAFETY

Each Course of Study Outline contains a complete section on shop safety. Included are general statements for the overall program, and specific statements relating only to the shop under discussion.

A sample of the General and Specific Statements for one course follows. (Sample No. 10) Specific shop safety rules for all courses will be found in the separate course of study outlines.

In addition it is recommended that in each shop a Safety Committee, consisting of three to five students, be selected, with as many students retiring each month as is necessary to make it possible for all students to have an opportunity to serve as part-time members of the committee. One a.m. student and one p.m. student (with alternates) should represent each shop on the School Safety Council.

Some of the duties of a School Shop Safety Committee are:

1. Develop and revise shop safety recommendations.
2. Check the shop for unsafe practices and accident hazards.
3. Recommend changes or additions to eliminate unsafe conditions.
4. Investigate and report on each accident, with corrective actions established to prevent any recurrence.

School shop safety committees should follow as closely as possible the pattern of safety committees in the industries for which the students are being trained. A safety engineer from any of the surrounding industries should be invited as a guest lecturer on safety; this should be done as early in the school term as possible. In turn, the shop students should visit at least one industrial plant during the school year.

COURSE OF STUDY OUTLINE
(Sample)

Printing
Shop Safety

Objectives:

1. To learn how to work safely and how to prevent accidents.
2. To learn how to care for machinery and equipment so as to reduce the possibility of accidents.
3. To develop habits of good housekeeping, proper storage and handling of materials, and sanitation.
4. To become familiar with personal protective devices and the proper clothing to be worn for safety purposes.
5. To develop skill in the safe use of hand and portable tools.
6. To learn how to cooperate with others in the promotion and operation of a safety program in a school shop.

UNIT I ACCIDENT AND ACCIDENT PREVENTION

- A. Causes of Accidents
- B. Accident Prevention
- C. Accident Prevention and Safety Programs in Industry
- D. Accident Prevention as a Responsibility of All
- E. Importance of Proper Conduct and Attitude
- F. Dangers in Horseplay and Carelessness

UNIT II MAKING THE SHOP A SAFE PLACE TO WORK

- A. Shop Layout
- B. Painting
- C. Lighting
- D. Ventilation
- E. Floors
- F. Fire Prevention and Drills
- G. Sanitation and Personal Hyigiene

UNIT III MACHINE GUARDING

- A. Purpose of Guards
- B. Types of Guards
- C. Use of Guards
- D. Care and Maintenance of Guards

UNIT IV MAINTAINING A SAFE PLACE TO WORK

A. Housekeeping
    1. Floors
    2. Stairs
    3. Loose objects
    4. Materials
    5. Rags and waste
    6. Lockers and cabinets

B. Storage of Tools
C. Storage of Materials and Supplies
D. Shop Cleanliness
E. Dust, Fumes and Gases
F. Electrical Hazards

UNIT V PERSONAL PROTECTIVE DEVICES

A. Eye Protection
B. Protective Clothing
C. Foot Protection
D. Respirators

UNIT VI HAND AND PORTABLE TOOL SAFETY

A. Use of Correct Tools
B. Correct Use of Tools
C. Defective Tools
D. Hazards in Use of Specific Tools
E. Portable Electric Hand Tools
F. Pneumatic Tools

UNIT VII SHOP SAFETY PROGRAM

A. Safety Organization in Each Shop
B. Safety Rules and Regulations
C. Analysis of Shop Jobs for Safety Content
D. Job Safety Instruction
    1. Group
    2. Individual

E. Safety Meetings and Assemblies
F. Posters and Bulletin Boards
G. Films and Other Visual Aids
H. Safety Tests
I. Safety Contests
J. Shop Safety Surveys

UNIT VIII ACCIDENT INVESTIGATION AND REPORTING

A. First Aid
B. Accident Reports
C. Student Insurance
D. Protection of Teachers by "Save Harmless Law"

UNIT IX EYE PROTECTIVE DEVICES

A. Clear goggles are to be worn at all times when observing, aiding or performing operations using the composing-room saw.

UNIT X SAFE PRACTICES IN THE PRINT SHOP

A. Do not throw power switches on or push any starting buttons without the instructor's permission.
B. Do not use any hand or power machines without the instructor's permission.
C. Ask the instructor for a helper. Do not select one on your own.
D. Do not leave any oil or oiled paper on the floor.
E. Only one student shall run the paper cutter at a given time.
F. Never grab for a piece of paper in the machine or pick one up from the floor near the machine while it is in motion.
G. The blade of the paper cutter is sharp. Do not try to test the cutter by rubbing your finger against it.
H. Be careful when using the lead and slug cutter. Although the cutter is a hand machine, it can cut your finger.
I. Do not leave anything in the aisles or passage ways. Someone may trip because of this carelessness.
J. Never leave caps or covers off containers of cleaning liquids.
K. Do not lift anything heavy without the permission of the instructor.
L. Report all cuts or scratches to the instructor immediately.
M. Never leave the room without the instructor's permission.
N. Do not hold type with your mouth; wash your hands after handling type and before eating your lunch.
O. All rags containing cleaning fluid or ink should be placed in covered cans.
P. Be sure all forms are locked in the press.
Q. Keep safety guard down on stitcher at all times.
R. Do not put makeready knives in your pockets with the blade exposed.

SCIENCE LABS AND CLASSROOMS

The secondary science classroom, housing various forms of science laboratories, represents a need for safety instruction. The most typical laboratory accidents include glass cuts, fires, explosions, corrosions, skin irritations, and bodily toxicities. To preclude such accidents teachers should emphasize the transmission of a body of safety knowledge to students prior to the use of a science laboratory. Failure of a student to fully understand and appreciate the seriousness of safety precautions in the science laboratory should result in suspension of that student from participating in that part of the school curriculum until evidence of knowledge is shown.

General Considerations:

1. Experiments are not performed in the absence of the instructor.
2. Experiments must be completed when once started.
3. Teachers and students must be familiar with first-aid measures for specific chemicals before using those chemicals. Teacher and students should be prepared in the use of emergency showers, fire extinguishers, and eye-wash fountains.
4. Floor obstructions must not be tolerated.
5. Protective wearing apparel must be donned before conducting an experiment.
6. Classroom movement must be at a minimum when conducting an experiment.
7. The inhalation of toxic vapors and gases must be avoided.
8. Liquids and particularly acids must be stored on the lowest shelving possible.
9. Teachers and students must not eat or drink anything in the laboratory.

Training involved in chemistry classes should stress the following:

1. Proper methods of carrying glass tubing and other glass equipment.
2. Proper breaking and bending of glass tubing.
3. Proper methods of inserting glass tubing into stoppers.
4. Use of gloves when handling glass tubing.
5. Avoidance of other than absolutely horizontal surfaces when setting up experiments.
6. Inspection of flasks in conducting suction experiments for weakened or cracked surfaces.
7. Confining pressure experiments to approved pressure vessels.

Training should emphasize chemical handling methods, methods of storing and using compressed gasses, and wearing of eye-protection devices.

Normally chemicals are poisonous to one degree or another. The absence of immediate indications of injury does not mean that a chemical is not in the process of producing injury if it has come into contact with live tissue. Free molecules ingested into

the lungs may produce injuries over a prolonged period of time. It is important, therefore, that ingestion or inhalation of chemicals not be allowed. Likewise, spills should immediately be cleaned and diluted with water. Mercury is particularly dangerous, and spills should be covered with sulphur or an approved commercial product. Keep mercury out of sinks and sewer drains Do not allow mercury to come into contact with skin any more than is necessary.

Dry ice (CO_2) is dangerous because of its extremely low temperature. It must be handled with tongs under conditions of adequate ventilation. Accidents sometimes occur because of improper labeling of contents. Not only should the proper chemical be on the label, but also the specifics of its danger to humans. Some labels also carry the antidote.

Open flames should be used to a minimum. Electrical heat mantles and steam baths are more desirable. When using an open flame, particular inservice training or proper instruction must be accomplished prior to conducting the experiment.

The use of acids in chemistry laboratories is unavoidable. Training needs to emphasize the proper use of acids, first aid treatment for acid burns, and proper dilution methods as treatment in case of exposure.

The use of compressed gases should include specific precautions such as care in transporting cylinders, strapping the cylinders before use, proper pressure-regulator use, provision for complete cylinder-pressure reduction, proper labeling of cylinders and proper storage of cylinders.

The use of eye-protection devices in chemistry laboratories while conducting chemistry experiments must be maintained at all expense. Training should emphasize the wearing of eye-protective devices for all experiments in order that the habit be built in students prior to the conduction of experiments involving caustic and explosive chemicals or hot liquids.

CHAPTER V

PLAN FOR PERIODIC INSPECTIONS AND MAINTENANCE OF FACILITIES, TOOLS, MACHINES, EQUIPMENT AND PERSONAL PROTECTIVE DEVICES

A. Individualized Inspections

Inspections are conducted on three levels: the teacher self-inspection, the principal inspection, the Safety Director inspection.

B. The Teacher Inspection

Teachers should conduct a self-inspection of shops and equipment not less than once a month.

Teachers should insure that their shops are free from hazardous obstacles. When teachers are in doubt about reporting a questionable practice or condition to the school principal, they should do so without hesitation.

The classified administrator establishes safety regulations pertaining to self-inspections, use of guards, equipment operation and accident reporting.

C. The Principal Inspection

The principal normally conducts inspections of the following facilities as needed:

1. Instructional shops
2. Maintenance shops
3. Warehouse
4. Grounds facilities
5. Food services center
6. Textbook storage area
7. School custodial and food-distribution facilities
8. Classrooms and all other areas

D. The Safety Director Inspection

Inspections by the Safety Director are conducted twice per year. The District Safety Director may delegate this duty to another administrator. The purpose of the inspection should be to improve safety and not to find fault. Inspections are carried out with the intent and spirit of providing students and employees with a safe learning and working environment. The function of the safety inspection report is not to find fault, condemn or accuse. It is to bring OSHA or state minimum safety standards to bear upon the school environment. The responsibility for any action pursuant to the safety inspection report rests with the school principal or department head.

Inspections should be conducted while the facility or space is in use in order for the inspector to comment on practices as well as conditions. When practical, the respective school or department safety committee member should accompany the inspector. The school principal should approve of the inspection before it is conducted and should be aware of the presence of the inspector on the campus or facility.

E. Safety Checklists Based on OSHA Standards

The following checklist was developed by the Utah Board of Education, based on OSHA recommendations. (It has been very slightly modified.) It should prove helpful to all personnel concerned with any aspect of school safety. However, a really effective checklist must be adapted to an individual operation. Therefore each teacher should develop an individual checklist for his or her own shop, laboratory, classroom, or whatever, keeping in mind that the checklist which follows here should be used as a guide only. Sample No. 11 that follows is an eye-protection and a respirator questionnaire.

1. General:

C	NC	NA*	
—	—	—	a. A "Safety and Health Protection on the Job" poster must be displayed in a prominent place.
—	—	—	b. Employers (local school authorities) must keep an injury and illness report for all instructors and students. OSHA Recordkeeping Requirements.
—	—	—	c. Instructors should conduct regular self-evaluations (inspections of their educational programs).
—	—	—	d. Instructors should initiate and continuously maintain an appropriate safety program.
—	—	—	e. Instructors should have a written statement outlining proper procedures to follow in the event of an accident.
—	—	—	f. Accident reports should be made out as soon as possible after an accident has occurred. Copies of the report should be retained in the instructor's file. Additional copies of the report should be filed in appropriate administrative offices.

2. Buildings:

—	—	—	a. Every building designed for human occupancy shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency.
—	—	—	b. Each facility shall have adequate toilet faciliites, which are separated for separate sexes.
—	—	—	c. All exits shall be clearly visible, or the route to reach them shall be conspicuously indicated.
—	—	—	d. All exits shall be marked by readily visible signs.
—	—	—	e. It is recommended that a minimum clearance of not less than seven feet six inches should be provided over work areas or means of egress.
—	—	—	f. Every stairway, floor opening, or pit or floor hole into which a person can accidentally walk, shall be guarded.

* The classifications "C," "CN," and "NA" utilized in this checklist are abbreviations for the terms "Compliance," "Non Compliance," and "Not Applicable," respectively.

C NC NA

___ ___ ___ g. All flights of stairs having four or more risers shall be equipped with standard stair railings.

___ ___ ___ h. Classrooms, offices and laboratories shall be lighted with not less than 30 foot-candles. Drafting rooms shall be lighted in not less than 50 foot-candles.

___ ___ ___ i. An adequate number of waste receptacles shall be provided and maintained in a sanitary condition.

___ ___ ___ j. Specific signs must be displayed to define specific hazards of a nature that failure to designate them may lead to accidental injury to workers or to the public.

___ ___ ___ k. Corridors and storage areas shall be lighted in not less than 10 foot-candles.

___ ___ ___ l. Accident-prevention tags are a temporary means of warning and should be used until a positive means can be employed to eliminate the hazard.

___ ___ ___ m. All shops shall be kept clean and orderly and in a sanitary condition. Cleaning and sweeping shall be done in a manner to minimize contamination of the air.

___ ___ ___ n. All wall openings from which there is a drop of more than four feet shall be guarded.

___ ___ ___ o. The Vocational Division should be contacted when new installations of facilities, material or equipment are made which may endanger the safety or health of students.

3. Storage Area

C NC NA

___ ___ ___ a. Storage of material shall not create a hazard.

___ ___ ___ b. All storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage.

___ ___ ___ c. Floor areas under material and storage racks should be kept free of stored materials as well as debris, refuse, scrap and other foreign matter.

4. Work Areas

___ ___ ___ a. Safety zones should be marked off around every work area where there is danger of possible injury.

___ ___ ___ b. Non-skid type paint or abrasive material should be placed in the work areas of equipment where there is danger of slipping or of receiving injury. Rubber mats around the machines are not recommended.

___ ___ ___ c. Floors should be kept free of dangerous projections and obstructions and should be kept free from debris, refuse, scrap, oil and other foreign matter.

___ ___ ___ d. Scrap boxes, strategically placed near scrap-producing equipment or work areas should be used to help keep scrap off the floor and the shop area clean.

5. Color Coding

Safety Color Code for marking physical hazards.

The following safety color codes shall be used for marking physical hazards:

C NC NA

— — — a. RED: Shall be used as the basic color for the identification of fire protection equipment and apparatus... If painting the extinguisher is impractical or undesirable, color should be used on the housing, wall, or support to identify the location of such equipment ....

(ii) DANGER ....

(iii) STOP. Emergency stop bars, buttons, or electrical switches on hazardous machines shall be red.

— — — b. ORANGE: Orange shall be used as the basic color for designating dangerous parts of machines or energized equipment. Orange shall be used to emphasize hazards when enclosure doors are open or when gear bolts, or other guards around moving equipment, are open or removed, exposing unguarded hazards.

— — — c. YELLOW: Yellow shall be the basic color for designating caution and for marking physical hazards. Solid yellow, yellow and black stripes, or checkers (or yellow with suitable contrasting background) should be used interchangeably, using the combination which will attract the most attention ...

— — — d. GREEN: Green shall be used to designate safety and the location of first-aid equipment (other than fire- fighting equipment).

— — — e. BLUE: Blue shall be the basic color for designation of Caution, limited to warning against the starting, use of, or the movement of equipment under repair or being worked upon.

— — — f. PURPLE: Purple shall designate radiation hazards.

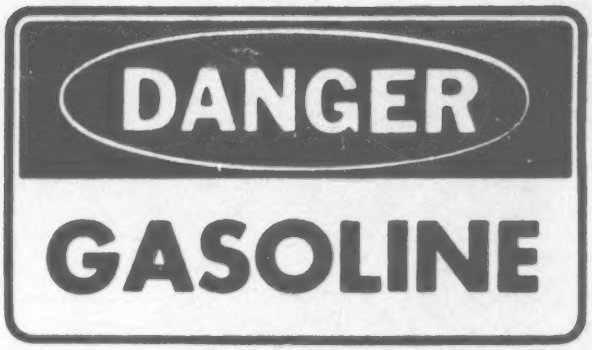
— — — g. BLACK & WHITE: Black, white, or a combination of these two shall be the basic colors for designation of traffic and housekeeping markings.

— — — h. Colors shall meet the tests specified in section 3, color definitions, of ANSI 253.1-1967 Safety Color Code for marking physical hazards.

6. Signs and Tags

— — — a. Signs and symbols shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist.

— — — b. Danger signs shall be used only where an immediate hazard exists. Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.



NATIONAL SAFETY COUNCIL
DANGER SIGN

C NC NA

— — — c. Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices. Caution signs shall have yellow as the predominating color; black upper panel and borders; yellow lettering of "caution" on the black panel; and the lower yellow panel for additional wording.

NATIONAL SAFETY COUNCIL
CAUTION SIGN

— — — d. Exit signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field (OSHA standards do not require this specific color design but do require red) and the principal stroke of the letters shall be at least three-fourths inch in width.

C NC NA

— — — e. Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

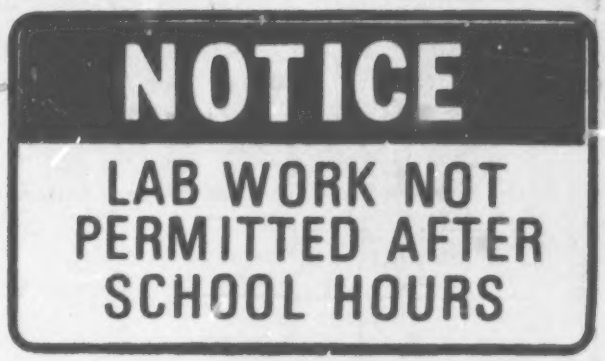
SAFETY RULES
CAREFULLY READ INSTRUCTION MANUAL BEFORE OPERATING MACHINE.
DO NOT OPERATE WITHOUT ALL GUARDS AND COVERS IN POSITION.
BE SURE MACHINE IS ELECTRICALLY GROUNDED.
REMOVE OR FASTEN LOOSE ARTICLES OF CLOTHING SUCH AS NECKTIES, ETC. CONFINE LONG HAIR.
REMOVE JEWELRY SUCH AS FINGER RINGS, WATCHES, BRACELETS, ETC.
USE SAFETY FACE SHIELD, GOGGLES, OR GLASSES TO PROTECT EYES AND OTHER PERSONAL SAFETY EQUIPMENT AS REQUIRED.
STOP MACHINE BEFORE MAKING ADJUSTMENTS OR CLEANING CHIPS FROM WORK AREA.
KEEP THE FLOOR AROUND THE MACHINE CLEAN AND FREE FROM SCRAPS, SAWDUST, OIL OR GREASE TO MINIMIZE THE DANGER OF SLIPPING.

— — — f. Directional signs, other than automotive traffic signs, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.

NATIONAL SAFETY COUNCIL
DIRECTIONAL SIGN

C NC NA

— — — g. Blue shall be the standard color for informational signs. It may be used as the background color for the complete sign or as a panel at the top of such types of "Notice" signs, which have a white background.



NATIONAL SAFETY COUNCIL
INFORMATIONAL SIGN

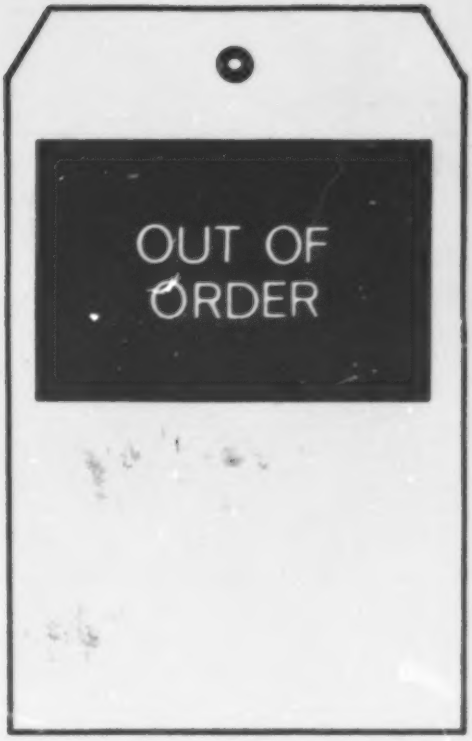
— — — h. There shall be no variation in the type of design of signs posted to warn of specific dangers and radiation hazards.

— — — i. The colors, proportions, and location of the identification panels of each sign shall be in accordance with the Standard Proportions for Safety Instruction Signs.

— — — j. All employees shall be instructed that danger signs indicate immediate danger and that special precautions are necessary.

— — — k. Accident-prevention tags shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They shall not be used in place of, or as a substitute for, accident-prevention signs.

DANGER


OUT OF
ORDER

DO NOT
START

CAUTION

7. Personal Protection

C	NC	NA	
—	—	—	a. The teacher is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions.
—	—	—	b. The teacher shall instruct each student in the recognition and avoidance of unsafe conditions and the regulations applicable to his/her work environment to control or eliminate any hazards or other exposure to illness or injury.
—	—	—	c. All exposures to any material or substance at concentrations above those specified in the Threshold Limit Values of Airborne Contaminants for 1970, shall be avoided by exhaust of fumes, or protective equipment shall be provided and used.
—	—	—	d. Safety shoes shall be worn to protect against foot injury where heavy pieces of equipment are handled.
—	—	—	e. All persons required to work in such a manner that their clothing may become wet shall be provided with such aprons, coats, jackets, sleeves, or other garments for protection.
—	—	—	f. Protection against the effect of noise shall be provided when the sound level exceeds 90 decibels for eight hours per day, 94 decibels for four hours per day, 100 decibels for 2 hours, or 105 decibels for one hour. Exposure to impulsive impact should never exceed 140-decibel peak sound.
—	—	—	g. Where instructors desire to provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.
—	—	—	h. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation or a combination of these hazards.
—	—	—	i. Respirators shall be provided by the Board when such equipment is necessary to protect the health of the students and instructor.
—	—	—	j. Head protection shall be used in any area where there is danger from falling or flying objects, and from limited electrical shock and burn.
—	—	—	k. Loose clothing such as tails, ties, lapels, cuffs, torn clothing or similar garments which can become entangled in moving machinery shall not be worn where an entanglement hazard exists.
—	—	—	l. Wrist watches, rings, or other jewelry shall not be worn on the job where they constitute a safety hazard.
—	—	—	m. Where there is a risk of injury from hair entanglement in moving parts of machinery, instructors and students shall confine their hair to eliminate the hazards.
—	—	—	n. Adequate facilities for maintaining personal cleanliness shall be provided. These shall be conveniently located and shall be maintained in a sanitary condition.

C NC NA

— — — o. If an employee is exposed to personal hazard the employer must provide appropriate protective equipment for the employee.

— — — p. Whenever protective equipment is provided by the employer, it shall be the duty of each employee (instructor) to use the equipment.

— — — q. Avoid inhaling fumes from brass, zinc, galvanized iron, or lead paint.

8. First Aid

— — — a. Employees (instructors) should have a written statement outlining proper first aid procedures.

— — — b. A list of telephone numbers and addresses, from which an emergency service can be secured, shall be posted in a conspicuous place (in classroom or shop buildings) so necessary help can be obtained in case of emergency. This list shall include:

(1) Responsible supervisor (school authorities)
(2) Doctor
(3) Hospital
(4) Ambulance
(5) Fire Department
(6) Police

— — — c. If a clinic, infirmary, or hospital is not nearby, a person must be available who has been adequately trained to render first aid.

— — — d. First aid supplies approved by the consulting physician shall be readily available.

— — — e. First aid services and provisions for medical care shall be made available by the employer for every employee.

— — — f. Any condition that exposes the eyes or any other part of the body to injurious corrosive materials must be supplied with a suitable facility for quick drenching or flushing of the eyes and body.

— — — g. Washing facilities, including soap, towels, and hot water, shall be provided for all persons required to handle any liquids which may burn, irritate, or may otherwise be harmful to the skin.

9. Fire Protection

— — — a. Portable extinguishers shall be maintained in a fully charged and operable condition and kept in their designated places.

— — — b. Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire.

— — — c. The locations and intended use of extinguishers shall be marked conspicuously.

— — — d. Extinguishers designed for separate classes of fires shall be marked conspicuously.

C NC NA

— — — e. Fire extinguishers suitable for the control of flammable liquid fires must be available, and one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of and not more than ten feet from the door opening of any flammable-materials storage room.

— — — f. Extinguishers shall be mounted on hangers, or in the brackets supplied, or in unlocked cabinets, or set on shelves.

— — — g. The number and size of extinguishers needed to protect : property shall be determined as prescribed in the UOSHA law.

— — — h. All extinguishers must be maintained at intervals of not more than one year. They shall be inspected thoroughly, recharged and/or repaired to insure operability and safety.

— — — i. The employer (LEA) shall be responsible for the development of a fire protection program.

— — — j. Carbon tetrachloride and other toxic vaporizing liquids for fire extinguishers are prohibited.

— — — k. Any extinguisher removed from the premises to be recharged shall be replaced by a spare extinguisher during its absence.

— — — l. Fire-protection equipment of the hose-system type shall meet the design requirements of the National Fire Protection Association Standard and OSHA.

10. Flammable Liquids

— — — a. Only approved containers or approved portable tanks shall be used to store flammable liquids or materials, and each portable tank shall be provided with one or more devices to allow venting in case internal pressure becomes too great.

— — — b. Portable cans for flammable liquids must be of no more than 5-gallon capacity, having a flash-arresting screen, spring closing lid, and spout cover so designed that it will safely relieve internal pressure when subjected to fire exposure.

— — — c. All solvent waste, oily rags, and flammable liquids shall be kept in fire-resistant covered containers.

— — — d. Storage cabinets for flammable or combustible liquids must be fire resistant and not more than 60 gallons of flammable or 120 gallons of combustible liquid may be stored in a storage cabinet.

— — — e. Cabinets for flammable and combustible liquids shall be labeled in conspicuous lettering "FLAMMABLE–KEEP FIRE AWAY."

— — — f. Cleaning solvents shall be restricted to those having flash points of not less than 100°F.

— — — g. Storage of flammable and combustible liquids which are incidental to the work being done, such as automobile assembly or construction of electronic equipment, shall be stored in tanks or closed containers.

C NC NA

— — — h. All dip tanks containing a flammable or combustible liquid shall have proper ventilation and have automatic extinguishing facilities.

— — — i. All liquified petroleum gases must be stored in approved containers and used with approved valves and manifold assemblies.

— — — j. When LP gas and other gases are stored or used in the same area, the containers shall be marked to identify their content.

— — — k. LP gas hoses shall be fabricated of materials that are resistant to the action of the LP gas in the liquid and vapor phases.

11. Compressed Gas and Gas Cylinders

— — — a. The safe condition and arrangement of compressed gas cylinders in the laboratory shall be determined by visual inspection.

— — — b. All compressed gas cylinders or portable tanks shall have pressure relief devices installed and maintained.

— — — c. The movement, handling, and storage of acetylene cylinders, acetylene pipe systems, and the generation of acetylene must be in accordance with the Compressed Gas Association pamphlet G-1.4-1966.

— — — d. All compressed gas cylinders shall be marked legibly with the name of the compressed gas contained therein.

— — — e. Compressed hydrogen must be stored in adequately ventilated areas at least 20 feet from any flammable materials or oxidizing gases, and at least 25 feet from any open flame or other source of ignition, and at least 25 feet from any concentrations of people, 50 feet from ventilation intakes or air-conditioning equipment and air compressors, and 50 feet from flammable gas storage.

— — — f. Compressed gas cylinders must be inspected regularly to determine that they are in a safe condition.

— — — g. Acetylene shall not be generated nor piped nor utilized at a pressure in excess of 15 p.s.i. gage pressure.

— — — h. Rules and instructions covering the operation and maintenance of oxygen and fuel gas supply equipment, including generators and oxygen or fuel gas distribution piping systems, shall be readily available.

— — — i. Compressed gas cylinders shall be stored away from radiators and other sources of heat. Inside buildings, the cylinders shall be stored in well-protected, well-ventilated dry locations at least twenty feet from highly combustible materials.

— — — j. Storage spaces for cylinders shall be located where they will not be knocked over or damaged by passing or falling objects.

— — — k. All compressed gas cylinders should be secured at all times to prevent accidental damage caused by falling or tipping over.

C NC NA

— — — l. Empty cylinders shall have their valves closed, and valve-protection caps shall be in place.

— — — m. Oxygen cylinders stored in an outside generator house shall be separated from the generator or carbide storage rooms by a non-combustible partition.

— — — n. Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials by a minimum distance of twenty feet, or by a non-combustible barrier at least five feet high.

— — — o. Oxygen cylinders or apparatus shall be kept free from oily or greasy substances and shall not be handled with oily hands or gloves.

— — — p. Gas cylinders not having fixed hand wheels for their valves shall have keys, handles, or special wrenches on the valve stems while these cylinders are in service.

— — — q. Gas cylinders shall be kept far enough away from the actual welding or cutting operation that sparks or hot slag will not reach them.

— — — r. Gas cylinders shall not be placed where they might become part of an electric circuit.

— — — s. Gas cylinders shall never be used as rollers or supports, whether full or empty, and the number and markings stamped into cylinders shall not be tampered with.

— — — t. Only the owner of the cylinder or person authorized by him shall refill a cylinder.

— — — u. Unless connected to a manifold, oxygen from a cylinder shall not be used without first attaching an oxygen regulator to the cylinder valve.

— — — v. Gas cylinder valves shall not be tampered with, nor shall any attempt be made to repair them.

— — — w. Fuel gas cylinders shall be placed with valve end up whenever they are in use.

— — — x. Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately to blow off sediment in the connection.

— — — y. Before a regulator is removed from a cylinder valve, the valve shall be closed and the gas released from the regulator.

— — — z. Nothing which may damage the safety device or interfere with the quick closing of the valve shall be placed on top of an acetyiene cylinder when in use.

— — — aa. Fuel gas shall never be used from cylinders without reducing the pressure through a suitable regulator.

— — — bb. An acetylene cylinder valve shall not be open more than one and one-half turns; preferably no more than three-fourths of a turn.

12. Air Systems and Compressors

— — — a. Every air receiver must have a drain pipe and valve at the lowest point of the receiver.

C NC NA

— — — b. Every air receiver shall be equipped with an indicating pressure gage and with one or more spring-loaded safety valves.

— — — c. All safety valves on air receivers shall be tested frequently and at regular intervals to determine if they are in good operating condition.

— — — d. Compressed air shall not be used for cleaning except where reduced to less than thirty p.s.i., and then only with effective chip guarding and personal protective equipment.

— — — e. Compressed air should not be used for cleaning clothing or machines in industrial education programs.

13. Electrical

NOTE: Items in this section have been extracted from the Federal Register May 19, 1971.

— — — a. Connections of electrical wires to terminals shall be such as to insure a solid connection without damaging the conductors, and shall be made by means of pressure connectors (including the screw type) or solder. A No. 8 or smaller conductor may be connected by means of clamps or screws with terminal plates having upturned lugs.

— — — b. Conductors shall be spliced or joined with approved splicing devices or soldered with a fusible metal or alloy.

— — — c. Over-current devices shall be enclosed in cutout boxes or cabinets.

— — — d. Fuses and circuit breakers shall be so located or shielded that persons will not be burned or otherwise injured by their operation.

— — — e. Extension cords shall be protected against accidental damage caused by traffic, sharp corners, or projections, and pinching in doors or elsewhere.

— — — f. Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

— — — g. Extension cords used with portable tools and appliances shall be of three-wire type.

— — — h. All alternating-current systems shall be grounded when they can be so grounded that the maximum voltage to ground does not exceed 150 volts.

— — — i. All metal enclosures which are free from ground contact shall be grounded except runs of less than 25 feet.

— — — j. All equipment connected by cords and plugs which are liable to become energized shall be grounded.

— — — k. The path to ground from circuits, equipment, and conductor enclosures shall be permanent and continuous, and shall have ample current-carrying capacity to conduct safely any currents liable to be imposed upon it.

— — — l. The grounding conductor of a wiring system shall also be used for grounding equipment.

C NC NA

— — — m. Each flexible cord shall be equipped with attachment plug and shall be energized from an approved receptacle outlet.

— — — n. Flexible cord shall not be used as a substitute for the fixed wiring of a structure for run-through holes in walls, ceilings, or floors, or run-through windows or doorways, or similar openings.

— — — o. Flexible cord shall be used only in continuous length without splice or tap.

— — — p. Flexible cord shall be so connected to the current source and to fittings that tension will not be transmitted to joints or terminal screws.

— — — q. Portable electrically-heated appliances rated at more than 50 watts and reaching temperatures in excess of 121 degrees Centigrade, shall be provided with the underwriter-approved heater cords.

— — — r. Infra-red heating lamps rated at 300 watts or less, may be used with lamp holders of the medium-base, unswitched porcelain type.

— — — s. Screw-shell lamp holders shall not be used with infra-red lamps over 300 watts rating.

— — — t. Each appliance shall be provided with a means for disconnection from all ungrounded conductors.

— — — u. Switches, circuit breakers, motor controllers, and fuses, including push-buttons, relays, and similar devices, shall be provided with enclosures, and the enclosure in each case, together with the enclosed apparatus, shall be approved as a complete assembly.

— — — v. Circuit breakers, motor controllers, and switches shall be provided with enclosures approved for their class of operation.

— — — w. By suitable guard or by location, each fixture shall be protected against physical damage.

— — — x. All electrical devices located in an explosive-type atmosphere shall be protected and sealed against arcing which would cause ignition of the atmosphere.

14. Use of Abrasives

— — — a. Floor- and bench-mounted grinders shall be provided with rests which are rigidly supported and readily adjustable. Such work rests shall be kept at a distance not to exceed one-eight (1/8) inch from the surface of the wheel.

— — — b. The concentration of dust or fumes in the breathing zone of an abrasive blasting operator shall be kept below the level specified by OSHA.

— — — c. Air exhausted from abrasive blasting equipment shall be discharged through dust collecting equipment.

— — — d. Respirators shall be worn by all abrasive blasting operators when using silica sand when the nozzle and the blast are not physically separated from the operator.

— — — e. Labs performing dry grinding, polishing, or buffing shall provide suitable hood or enclosures that are connected to an exhaust system.

C NC NA

— — — f. The abrasive wheel guard shall cover the spindle and nut and flange projections.

— — — g. On bench and floor-stand grinding wheels, the safety guards shall be such that the exposure of the wheel will not exceed 90 degrees or ¼ of the periphery.

— — — h. On surface grinders and cutoff machines, the exposed portion of the blade shall not exceed 150 degrees.

— — — i. Blotters or compressible washers shall always be used between the flanges of the abrasive wheel.

— — — j. On all grinders, the driving flange shall be securely fastened to the spindle.

— — — k. Abrasive wheels shall be mounted between flanges which shall be not less than one-third the diameter of the wheel.

— — — l. Before mounting any abrasive wheel, it shall be inspected closely and sounded by the user with the ring test to make sure it has not been damaged.

— — — m. When bushings are used in the wheel hole on abrasive wheels, they shall not exceed the width of the wheel, and shall not contact the flange.

— — — n. Grinding machines shall be supplied with sufficient power to maintain the spindle speeds at manufacturer-rated levels under all conditions of normal operation.

— — — o. The maximum exposure of the grinding wheel periphery on portable grinders and sides shall not exceed 180 degrees. The top half of the wheel shall be enclosed at all times.

15. Hand Tools

— — — a. Teachers shall not issue nor permit the use of unsafe hand tools.

— — — b. Wrenches, including adjustable pipe, end, and socket wrenches, shall not be used when jaws are sprung to the point that slippage occurs.

— — — c. Impact tools such as drift pins, wedges, and chisels shall be kept free from mushroomed heads.

— — — d. The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tools.

16. Jacks and Hoists

— — — a. All jacks shall have a positive stop to prevent overtravel.

— — — b. Fluids used in hydraulic-powered tools shall be fire-resistant.

— — — c. The operator shall make sure that the jack used has a rating sufficient to lift and sustain the load.

— — — d. All jacks must have a firm foundation, or the base of the jack shall be blocked to prevent slippage. If there is danger of slippage of the object on the jack, it also shall be blocked.

— — — e. After a load has been raised, it shall be cribbed, blocked, or otherwise secured at once.

— — — f. Each jack shall be thoroughly inspected every six months.

— — — g. The size of load on any crane or hoist shall not exceed its rated load.

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17. Industrial Trucks and Forklifts

___ ___ ___ a. High lift rider trucks shall be fitted with an overhead guard.

___ ___ ___ b. Concentration levels of carbon monoxide gas created by powered industrial trucks shall not exceed the level specified in OSHA 1910.93.

___ ___ ___ c. Only trained and authorized operators shall be permitted to operate a powered industrial truck.

___ ___ ___ d. When leaving a powered industrial truck, the high lift shall be fully lowered, controls shall be neutralized, the power shut off, brakes set, and the key or connector plug removed.

___ ___ ___ e. A powered industrial truck shall be kept in safe repair at at times.

18. Lead Acid Storage Batteries

___ ___ ___ a. When changing batteries, facilities should be provided for flushing and neutralizing spilled electrolyte and for adequate ventilation of fumes from gasing batteries.

___ ___ ___ b. Face shields, aprons, and rubber gloves shall be provided for persons handling acids or batteries.

___ ___ ___ c. Battery-charging installations shall be located in areas designated for that purpose.

___ ___ ___ d. A carboy tilter or siphon shall be provided for handling electrolyte.

___ ___ ___ e. When mixing electrolyte, acid shall be poured into water; water shall not be poured into acid.

___ ___ ___ f. When charging batteries, the vent caps should be kept in place to avoid electrolyte spray.

___ ___ ___ g. Smoking shall be prohibited in the charging area.

___ ___ ___ h. Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery-charging areas.

19. Machine Hazards Guarding

___ ___ ___ a. Each teacher shall be responsible for the safe condition of tools and equipment used by students.

___ ___ ___ b. One or more methods of machine guarding shall be provided to protect the operator and others in the machine area from hazards.

___ ___ ___ c. General requirements for machine guards: Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

___ ___ ___ d. The point of operation of machines where operation exposes an employee to injury shall be guarded.

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—	—	—	e.	Special tools shall be provided to assist the operator so that his/her hands will not be in the danger zones.
—	—	—	f.	Machines designed for a fixed location shall be securely anchored to prevent walking or moving.
—	—	—	g.	All belts, pulleys, gears, shafts, and moving parts shall be guarded, if exposed to contact by anyone or otherwise create a hazard.
—	—	—	h.	A control switch must be provided on each machine that allows the operator to turn off the power without leaving his position at the point of operation.
—	—	—	i.	On any machine where injury to the operator might result if motors restart after power failure, restarting shall be prevented by means of an automatic cutout switch.
—	—	—	j.	Equipment or circuits that are de-energized shall be rendered inoperative and have tags attached at all points where the equipment or circuits can be energized.
—	—	—	k.	All pneumatically driven nailers, staplers, and other equipment provided with automatic-fastener feed, which operates at more than 100 pounds per square inch pressure at the tool head, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.
—	—	—	l.	A bandsaw shall be so guarded that the sawblade shall be enclosed except for the working portion of the blade between the bottom of the guide rolls and the table.
—	—	—	m.	A guard for the blade on the bandsaw shall protect the saw blade at the front and outer side, and this portion of the guard shall be self-adjusting to raise and lower with the guide.
—	—	—	n.	All bandsaws shall be provided with a tension-control device to indicate proper tension.
—	—	—	o.	Hand-held, power-driven tools shall be provided with appropriate switches for each type of tool.
—	—	—	p.	All portable electric tools must be properly grounded by a separate ground wire and polarized plug and receptacle.
—	—	—	q.	All penumatic power tools shall have the operating trigger so located as to minimize the possibility of its accidental operation, and shall be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed.
—	—	—	r.	The muzzle end of an explosive-actuated or high-velocity tool shall have a protective shield or guard at least three and one-half inches in diameter, mounted perpendicular to and concentric with the barrel, and designed to confine any flying fragments that might otherwise create a hazard at the time of firing.

20. Graphic Arts

—	—	—	a.	All roller-type printing machines will be supplied with nip guards.

C NC NA

— — — b. All roller gears shall be provided with a protective disc which will enclose the nips of the inrunning gears.

— — — c. The nip at the inrunning side of all calender rolls shall be provided with a guard extending across the entire length of the nip and arranged to prevent the fingers of the workers from being pulled in between the rolls.

— — — d. On all rotary staple cutters, a guard shall be installed completely enclosing the cutter, to prevent the hands of the operator from reaching the cutting zone.

21. Carpentry, Cabinet-Making

— — — a. Each woodworking machine shall be so constructed as to be free from sensible vibration when the largest size tool is mounted and run idle at full speed.

— — — b. Circular saw fences shall be so constructed that they can be firmly secured to the table without changing their alignment with the saw.

— — — c. Circular saw gages shall be constructed so as to slide in grooves or tracks that are accurately machined.

— — — d. Hinged saw tables shall be so constructed that the table can be firmly secured in any position and in true alignment with the saw.

— — — e. It is recommended that each power-driven woodworking machine be provided with a disconnect switch that can be locked in the "OFF" position.

— — — f. Exhaust systems for the removal of undesired vapors or dusts shall be in operation continually during all operations which they are designed to serve.

— — — g. Featherboards or suitable jigs shall be provided wherever standard guarding cannot be used in dadoing, grooving, jointing, molding, and rabbeting.

— — — h. On tenoning machines, all feed chains and sprockets shall be completely enclosed, and all sprockets and chains shall be guarded at the sides by plates, and each tenoning machine shall have all cutting heads and saws, if used, covered by metal guards.

— — — i. Each hand-fed saw shall be guarded by a hood, which shall completely enclose that portion of the saw above the table.

— — — j. Each hand-fed circular saw shall be furnished with a spreader.

— — — k. The upper hood of the radial saw shall completely enclose the upper portion of the blade and include the saw arbor.

— — — l. The radial saw used for ripping must be provided with nonkickback fingers or dogs.

— — — m. Adjustable stops shall be provided on radial saws to prevent the forward travel of the blade beyond the position necessary to complete the cut.

— — — n. The installation of a radial saw shall be such that the front end of the unit will be slightly higher than the rear, so as to cause the cutting head to return gently to the starting position when released by the operator.

— — — o. On a radial saw, the direction of saw rotation shall be conspicuously marked on the hood.

C NC NA

— — — p. The knife projection on a jointer shall not exceed 1/8" beyond the cylindrical body of the head.

— — — q. On a jointer, the clearance between the edge of the rear table and the cutter head shall be no more than 1/8", and the table throat opening shall not be more than 1½" when the tables are set or aligned for a zero cut.

— — — r. Each jointer with a horizontal cutting head shall have an automatic guard which will cover all sections of the head on the working side of the fence or gage.

— — — s. Each jointer must have a guard which will cover the section of the head in back of the gage or fence.

— — — t. On a wood shaper, the cutting heads of each machine shall be enclosed with a cage or adjustable guard so designed as to keep the operator's hand away from the cutting edge.

— — — u. Each planing machine shall have all cutting heads covered by a metal guard.

— — — v. On a planer, all feed rolls shall be guarded by a hood to prevent hands of the operator from coming in contact with the inrunning rolls at any point.

— — — w. Wood lathes used for turning long pieces of stock held only between the two centers shall be equipped with long curved guards extending over the tops of the lathes.

— — — x. Each drum sanding machine shall have an exhaust hood or other guard, if no exhaust system is required over the drum.

— — — y. Disk sanding machines shall have an exhaust hood or other guard.

— — — z. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to the pulley.

— — — aa. Woodworking machinery with blades that are dull, badly set, improperly filed, or improperly tensioned shall be immediately removed from service.

— — — bb. Appropriate push sticks or blocks, in several sizes and types for the work to be done, shall be available at the workplaces on all woodworking machines.

— — — cc. All portable circular saws shall be equipped with guards above and below the base plate or shoe, and when the tool is withdrawn from the work, the lower guards shall automatically and instantly return to covering position.

— — — dd. Portable belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to the pulley.

22. Welding Area

— — — a. Oxygen manifolds shall not be located in an acetylene generator room.

— — — b. An oxygen manifold to which cylinders having an aggregate capacity of more than 6,000 cubic feet of oxygen are connected, shall be located outdoors.

— — — c. Master shut-off valves for both oxygen and fuel gas shall be provided at the entry end of the portable outlet header.

— — — d. When acetylene cylinders are coupled, approved flash arresters shall be installed between each cylinder and the coupler block.

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—	—	—	e.	Each fuel-gas cylinder head shall be provided with a back-flow check valve.
—	—	—	f.	Protective equipment shall be installed in the fuel-gas piping to prevent backflow of oxygen into the fuel-gas supply system; passage of the flashback into the fuel-gas supply system; and excessive back pressure of oxygen in the fuel-gas supply system.
—	—	—	g.	Stations equipped with approved backflow and flashback devices may have as many as four torches supplied from one station outlet, with each outlet supplied with a shut-off valve.
—	—	—	h.	The generally recognized colors for welding hoses are: red for acetylene, green for oxygen hose and black for inert gas and air hose.
—	—	—	i.	When parallel lengths of oxygen and acetylene hoses are taped together, not more than four inches out of twelve inches shall be covered by tape.
—	—	—	j.	Acetylene generators shall be of approved construction and shall be plainly marked with the maximum rate of acetylene in cubic feet per hour for which they are designed, and the weight and size of carbide necessary for a single charge.
—	—	—	k.	Relief valves on acetylene generators shall be regularly operated to insure proper functioning and must not be set in excess of 15 p.s.i.
—	—	—	l.	Non-automatic generators shall not be used for generating acetylene at pressures exceeding one p.s.i., and all water overflow shall be visible.
—	—	—	m.	The use of common salt or other corrosive chemicals for protection against freezing of generators is not permitted.
—	—	—	n.	Portable acetylene generators shall not be used within ten feet of combustible materials other than the floor.
—	—	—	o.	Portable generators shall not be used in rooms of total volume less than thirty-five times the total gas-generating capacity per charge of all generators in the room.
—	—	—	p.	Generators shall not be used in rooms having a ceiling height of less than ten feet.
—	—	—	q.	Portable generators shall be cleaned and recharged and the air mixture blown off outside of buildings.
—	—	—	r.	The water carbide residue mixture drained from the generator shall not be discharged into sewer pipes.
—	—	—	s.	Portable generators shall be located at a safe distance from the welding position so that they will not be exposed to sparks, slag, or misdirection of the torch flame.
—	—	—	t.	Calcium carbide shall be contained in metal packages of sufficient strength to prevent rupture. These packages shall be water- and air-tight and shall be conspicuously marked, CALCIUM CARBIDE – DANGEROUS IF NOT KEPT DRY.
—	—	—	u.	Only quantities of calcium carbide of less than 600 pounds may be stored indoors.

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—	—	—	v.	Open-circuit voltages for arc welding and cutting machines shall not exceed 80 volts for manual alternating current machines, 100 volts for automatic machines, and 100 volts for manual direct current machines.
—	—	—	w.	Terminals for welding leads should be protected from accidental electrical contact by personnel or metal objects.
—	—	—	x.	All ground connections shall be checked to determine if they are mechanically strong and electrically adequate for the required current.
—	—	—	y.	A disconnecting switch or controller shall be provided at or near each welding machine.
—	—	—	z.	Printed rules and instructions covering the operation of arc welding equipment supplied by the manufacturer shall be strictly followed.
—	—	—	aa.	Electrode holders, when not in use, shall be placed so that they cannot make electrical contact with persons or compressed gas tanks.
—	—	—	bb.	Cables with splices within ten feet of the holder shall not be used.
—	—	—	cc.	Cables from the arc welder should be inspected frequently for wear and damage.
—	—	—	dd.	Spot and seam welding machines shall have all external welding control circuits less than 120 volts.
—	—	—	ee.	All press-welding machine operations, where there is a possibility of the operator's fingers being under the point of operation, shall be guarded by use of a device such as electronic eye circuit or two hand controls.
—	—	—	ff.	On spot welders, a shield guard of safety glass or suitable fire-resistant plastic may be necessary at the point of operation.
—	—	—	gg.	All foot switches on spot welders shall be guarded to prevent accidental operation of the machine.
—	—	—	hh.	Whenever welding or cutting is performed in locations where a fire might develop, fire watchers shall be required.
—	—	—	ii.	Fire watchers shall have fire extinguishing equipment readily available and be trained in its use.
—	—	—	jj.	Cutting or welding shall be permitted only in areas that are or have been made fire-safe.
—	—	—	kk.	No welding or cutting shall be performed on containers having flammable materials until they have been absolutely cleaned.
—	—	—	ll.	Where the welding or cutting torch is not in use, the torch valve shall be closed and the gas supply to the torch positively shut off at some point outside the confined area.
—	—	—	mm.	Helmets or handshields shall be used during all arc welding or cutting operations.
—	—	—	nn.	Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations.

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—	—	—	oo.	All operators and attendants of resistance-welding or resistance-brazing equipment shall use transparent face shields or goggles.
—	—	—	pp.	Helmets and hand shields shall be made of a material which is an insulator for heat and electricity.
—	—	—	qq.	Helmets and hand shields shall be arranged to protect the face, neck, and ears from direct radiant energy, and they shall be provided with filter plates and cover plates designed for easy removal.
—	—	—	rr.	All filter lenses shall bear some permanent distinctive mark by which the source and shade may be identified readily.
—	—	—	ss.	Prescribed filters shall be used for particular types of welding.
—	—	—	tt.	Where the work permits, the welding should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide and lamp black.
—	—	—	uu.	All arc welding electrode-holders must be adequately insulated on all their outer surfaces.
—	—	—	vv.	All those exposed to the hazards created by welding, cutting or brazing operations shall be protected by personal protective equipment.
—	—	—	ww.	Welding exhaust ventilation shall consist of freely moving hoods intended to be placed by the welder or burner as close as practicable to the work.
—	—	—	xx.	All people, including the operator, in the area of inert-gas arc-metal welding, not protected by screening, shall be protected by filter lenses.
—	—	—	yy.	Welders and others who are exposed to the radiation shall be protected so that the skin is covered completely to prevent burns.
—	—	—	zz.	For welding operations, mechanical ventilation shall be provided in a space of less than 10,000 cubic feet per welder, or in a room having a ceiling height of less than 16 feet.
—	—	—	aaa.	Degreasing or other cleaning operations involving chlorinated hydrocarbons shall be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation.

23. Spray Finishing Operations

—	—	—	a.	Spray booths or spray rooms are to be used to enclose or confine all spraying operations.
—	—	—	b.	Spraying shall not be conducted outside of predetermined spraying areas.
—	—	—	c.	There shall be no open flame or spark-producing equipment in any spraying area nor within 20 feet thereof, unless separated by a partition.
—	—	—	d.	Electrical wiring and equipment in spray booths shall conform to the provisions of the National Electrical Code.
—	—	—	e.	Electric lamps outside of, but within twenty (20) feet of any spraying area, and not separated therefrom by a partition, shall be totally enclosed to prevent the falling of hot particles and shall be protected from mechanical injury by suitable guards or by location.

C NC NA

— — — f. Spray booths shall be substantially constructed of steel not thinner than No. 18 U.S. gauge, securely and rigidly supported, or of concrete or masonry, except that aluminum or other substantial noncombustible material may be used for intermittent or low-volume spraying. Spray booths shall be designed to sweep air currents toward the exhaust outlet.

— — — g. Electric motors driving exhaust fans shall not be placed inside booths or ducts.

— — — h. Ventilating and exhaust systems shall be in accordance with the Standard for Blower and Exhaust Systems for Vapor Removal, NFPA No. 91-1961.

— — — i. All spraying areas shall be provided with mechanical ventilation adequate to remove flammable vapors and mists.

— — — j. Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and drying finishing material residue to be exhausted.

— — — k. The use of electrostatic spraying equipment must conform to the standards set up.

— — — l. "NO SMOKING" signs on contrasting color backgrounds shall be conspicuously posted at all spraying areas and paint storage rooms.

24. Miscellaneous

— — — a. All equipment and materials used in concrete construction and masonry work shall meet the requirements as prescribed in ANSI – A10.9.

— — — b. Scaffolds shall be furnished and erected in accordance with the basic standards for all persons engaged in work that cannot be done safely from the ground, except for short periods of work that can be done from ladders.

— — — c. Hardening and tempering tanks should be located as far as practicable from the furnace and should not be located near other combustible materials. Tanks must be so designed that maximum workload is incapable of raising the temperature of the cooling medium to within 50° below its flash point.

— — — d. All cleaning operations involving immersion of materials in liquids shall be done in a tank designed for this purpose and with proper ventilation.

— — — e. All ladders must be maintained to insure safety and serviceability, and safety precautions must be observed in connection with the use of ladders.

Sample No. 11

EYE PROTECTION QUESTIONNAIRE

SHOP_____ TEACHER_____

DATE_____

	Yes	No	Does Not Apply
1. Are sufficient eye-protective devices, i.e., safety goggles, in good condition available for student use?			
2. Are safety goggles in good condition available for visitors' use?			
3. Is disinfectant for safety goggles available in shop for use when needed?			
4. Do you regularly inspect safety goggles?			
5. Does your course of study outline contain instructions for use of safety goggles?			
6. Are rules posted in shop relative to use of goggles?			
7. Do you have a.m. and p.m. safety council representatives?			

RESPIRATOR QUESTIONNAIRE

If the use of respirators is applicable in your shop, please answer these questions below.

1. Are sufficient respirators in good condition available for student use?			
2. Are respirators in good condition available for visitors' use?			
3. Is disinfectant for respirators available in shop for use when needed?			
4. Do you regularly inspect respirators?			
5. Does your course of study outline contain instructions for use of respirators?			
6. Are rules posted in shop relative to use of respirators?			

Present policy statement is adequate —— Yes_____ No_____

Present policy statement needs to be revised —— Yes_____ No_____

CHAPTER VI

PLAN FOR THE IDENTIFICATION AND ELIMINATION OF POTENTIAL HAZARDS

A. Housekeeping and Maintenance To Prevent Accidents

The most important component of a plan to identify and eliminate potential hazards is the person using the tools or equipment. Students must be taught to recognize potential hazards and to report them immediately to the teacher.

Teachers should set procedures for good housekeeping and maintenance that contribute toward the prevention of accidents.

Specifically, a few of the goals of effective housekeeping programs are:

1. To reduce or eliminate hazards which cause accidents from falls, slips, striking against objects, and falling objects.
2. To eliminate the hazards from fire through the provision of approved containers, proper storage facilities, and clean-up procedures.
3. To develop an awareness of the need for housekeeping measures in an accident-prevention program.
4. To develop the desired attitudes towards safe working conditions and practices and sanitary conditions.
5. To develop an understanding of the essentials of an effective housekeeping program.
6. To familiarize students with the responsibilities of housekeeping and to instill in them the desire for clean and orderly surroundings.

With regard to the elimination of hazards, the National Safety Council cites the following basic measures for preventing injuries from accidents:

1. Eliminate the hazard from the machine, method, material, or plant structure.
2. Control the hazard by enclosing or guarding it at its source.
3. Train personnel to be aware of the hazard and to follow safe job procedures to avoid it.
4. Prescribe personal protective equipment to shield personnel against the hazard.

With regard to maintenance as a factor in preventing accidents, the Council states it can operate in two ways:

1. routine repetitive maintenance necessary on a day-by-day basis to keep equipment clean and operating,

2. preventive maintenance, which involves overhaul of equipment in one degree or another or on a predetermined schedule before breakdown occurs.

These two approaches to maintenance differ only in the way they operate, and some overlapping is usually involved. In fact, both types of maintenance may be carried out to a degree by student personnel.

The use of the Utah Department of Education checklist in the previous chapter will be useful to the maintenance department in contributing to a safe workplace.

B. Custodial Rating Scale

The use of Custodial Rating Forms can also help toward identifying personnel whose attitude, ability, and work habits are such that they contribute toward making the school a safer place. (Sample 12)

C. The Daily Building Checklist shall be filled out by the custodian who does the checkout and turned in to the maintenance supervisor for followup. (Sample 13)

Sample No. 12

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS
CUSTODIAL EMPLOYEE RATING SCALE

Employee _____ School _____

Principal's (or Rater's) Signature _____ Date _____

The purpose of the rating is to help the employee improve through making an evaluation of his/her abilities, attitudes, and job performance. The rating scale, although not a complete and comprehensive description of custodial duties and responsibilities, can be useful as a checklist of desirable standards.

Rating Scale

4	Superior
3	Acceptable
2	Neglected or inferior
N	Does not apply

Instructions to Rater

Write a 4, 3, 2, or N in space in front of each statement. Feel free to make any qualifying statements or comments in space provided.

I. **Personal Qualities**

_____ 1. Good health and physical ability to perform duties.

_____ 2. Neat, clean, and presents a favorable appearance.

_____ 3. Follows directions, is cooperative, and works harmoniously with others.

_____ 4. Is courteous and helpful in dealing with visitors, teachers, and pupils.

_____ 5. Takes pride in the work and the school.

_____ 6. Trustworthy, dependable, and reliable.

_____ 7. Shows initiative and takes responsibility.

_____ 8. Willingly performs extra duties as needed, over and beyond the normal assignment.

Comments: _____

_____

_____

_____

_____

II. Safety and Protection of Building

_____ 1. Works safely and protects self and others from injury.

_____ 2. Makes frequent inspections to be sure building is fire-safe and reports conditions to principal.

_____ 3. Keeps stairways, entrances, and corridors free of obstructions, debris, and hazardous conditions.

_____ 4. Collects rubbish and waste materials and properly disposes of it.

_____ 5. Takes part in and assists with fire and air-raid drills.

_____ 6. Checks systematically and is careful that everything which should be locked up is secure, especially before leaving building at night.

Comments: _____

_____

_____

_____

III. Cleaning Duties

_____ 1. Takes pride in a clean school and takes extra pains to keep it that way.

_____ 2. Knows and uses proper methods, supplies, tools, and procedures in cleaning.

_____ 3. Is prompt and efficient in getting the work done.

_____ 4. Cleans thoroughly and completely.

_____ 5. Plans and organizes the work well in terms of daily chores, and less frequent seasonal cleaning.

_____ 6. Is especially thorough in cleaning areas where sanitation is paramount, such as toilets, cafeteria and kitchen, and locker rooms.

_____ 7. Keeps "out of sight" areas such as storerooms, boiler room, etc., just as clean and orderly as rest of building.

Comments: _____

_____

_____

_____

_____

IV. Repairs and Maintenance

_____ 1. Understands operation and care of all mechanical and electrical building services and equipment.

_____ 2. Regularly and systematically inspects building and mechanical and electrical services for necessary repairs or replacements.

_____ 3. Takes initiative in making minor repairs and performing routine maintenance; reports needs beyond own ability to principal.

_____ 4. Knows and uses proper tools, materials, and equipment for floor maintenance.

_____ 5. Cooperates with and assists maintenance mechanic when the latter is working in the building.

_____ 6. Is skilled in the use of hand tools, has own tools, and does not depend on shop teachers, students, or maintenance mechanic to do jobs he or she should do.

Comments: _____

_____

_____

_____

V. Care of Grounds

_____ 1. Takes pride in outside appearance of building and grounds.

_____ 2. Understands proper care of lawn, shrubbery, trees, walks, fences, and driveways.

_____ 3. Regularly and systematically cuts grass and trims shrubbery.

_____ 4. Keeps walks and driveways swept (or shoveled).

_____ 5. Takes proper care of flag.

Comments: _____

_____

_____

_____

VI. Heating System

_____ 1. Is qualified by license to operate the heating system.

_____ 2. Is regular and thorough in checking on proper operation of complete heating system: boiler and accessories, temperature controls, pumps, oil burners, etc.

_____ 3. Keeps track of fuel supply and sees that fuel is ordered if needed.

_____ 4. Keeps radiators and ventilating units around building clean and in good operating condition; reports any needed major repairs.

Comments: _____

_____

_____

_____

VII. **Care of Supplies, Tools, and Equipment**

_____ 1. Keeps clean and orderly storerooms, storage areas, and janitor's room.

_____ 2. Is economical and efficient in use of supplies.

_____ 3. Takes proper care of tools and equipment: their storage, use, and servicing.

_____ 4. Keeps an inventory and properly orders annual supplies, tools, and equipment as needed.

Comments: _____

_____

_____

_____

VIII. **Summary:** Total Score – _____

_____

_____

_____

_____

_____

_____

_____

110

Sample No. 13

BURR D. COE VOCATIONAL AND TECHNICAL HIGH SCHOOL
112 RUES LANE – EAST BRUNSWICK, N.J.

Daily Building Checklist

DATE: _____

TIME IN: _____

TIME OUT: _____

I have thoroughly checked the following areas on my assigned building tour.	Satisfactory	Time
1. All outside grounds.		
2. Broken windows: if any, indicate where. All windows are to be closed.		
3. All school entrances and exists. (To be closed and locked)		
4. Board of Education and General Offices. (Be sure they are locked)		
5. All shops and classrooms. (Are to be locked)		
6. Cafeteria, Bake Shop and Kitchen. (See if refrigeration is working)		
7. Locker rooms and all toilets. (Locked if possible)		
8. Loading platforms and stairs leading to basement. (Be sure they are locked)		
9. Be sure that elevator is in the basement at all times when leaving building.		
10. Boiler room: see that **boilers and circulating pumps** are running during heating seasons. **(At all times)**		
11. Check interior and exterior, Horticultural Building. See that **boiler is running at all times during heating season.**		

_____
Custodian on Duty

_____
Maintenance Supervisor

D. Safety Records

Careful and accurate reporting of accidents and good record-keeping are essential ingredients in the prevention of accidents.

The purpose of keeping safety records is to provide a continuing analysis of accidents by facility so that inservice training for both certificated and classified employees may be a reflection of the most typical types of accidents occurring in the school district. The keeping of records will also provide an accountability - monitoring system for correcting faulty facilities or equipment, subsequent to an inspection, and to instigate investigations of accidents when needed. Analysis of accidents is indispensable; it is therefore the responsibility of the Safety Director to disseminate information designed to maintain an awareness of adequate safety standards for classified and certificated personnel.

The safety director continually analyzes accidents as they occur and may make recommendations to the Superintendent or other appropriate administrator for equipment or facility modifications. He or she may also initiate written directives in order to correct poor safety practices on the part of personnel. The safety director coordinates semi-annual school and department safety inspections by building principals, as well as other inspections as needed.

E. Accident Investigation

The District Safety Director may elect to directly investigate accidents rather than rely exclusively on data supplied by insurance claim forms. The determination to conduct an investigation is made when either of two circumstances prevails:

1. A series of accidents has occurred that had a common factor, so that a precise investigation of the most recent of those repeated accidents will reveal the cause of the accidents and suggests the corrective measures needed.
2. One accident of severe enough gravity to warrant an investigation more thorough than that conducted by the reporting authority.

Accidents involving deaths shall be investigated by a board of inquiry designated by the Superintendent with the District Safety Director acting as chairman.

The purpose of an investigation is to find those facts that pertain to an accident. It is not to find fault with an individual or a department.

At least the following standard eight key facts shall be investigated and reported:

1. Nature of the injury
2. Part of the body
3. Source of the injury
4. Accident type
5. Hazardous condition
6. Tool or equipment involved
7. Specific part of tool or equipment involved
8. Unsafe act.

CHAPTER VII

EMERGENCY PROCEDURES TO BE FOLLOWED IN THE EVENT OF AN ACCIDENT INVOLVING A STUDENT, TEACHER, OR ANY OTHER INDIVIDUAL

A. General Statements

Emergency procedures are outlined in the policy manual, files JCFG/JGFGA. Where special equipment is required, such as eye-wash stations and drench showers, they shall be provided and installed according to state regulations. The school dispensary shall be equipped with emergency oxygen equipment. Any equipment judged to be unsafe shall be immediately tagged and removed from service.

A form must be filled out for *all* accidents or injuries. Form NJDE 523-5 for the State must be filled out only for accidents requiring treatment by a licensed doctor. (Sample 15)

Follow-up procedures are most important if the recurrence of a similar accident is to be avoided. Thus each accident should be followed by an investigation and recommendation by the shop safety committee.

The principal purpose of accident investigation is to obtain information through which recommendations for corrective action can be developed in order to prevent similar or other accidents, either in the area affected or elsewhere in the school shop system. This is accomplished by:

1. Seeking out the elements and sources from which the accident developed.
2. Analyzing the causal factors and making the necessary recommendations for eliminating them.
3. Developing cooperatively a "safety consciousness or awareness" by discussing and recording various information concerning safe conditions and safe work methods to be observed in any given school shop.

All accidents should be investigated, because all accidents are potentially serious. All are important, regardless of the degree of seriousness of any resulting injury, since the "injury-result" of any set of accident-producing circumstances is impossible to predict.

Accident investigations should be made as soon as possible after the accident.

B. Board Policy: Accidents /First Aid

A school nurse or other assigned staff member shall be responsible for providing emergency services in case of injury to, or sudden illness of, a student or staff member.

At each school, procedures shall be developed and made known for the proper handling of such emergencies. These shall incorporate the following requirements:

1. The school nurse or another trained person shall be responsible for administering first aid, except for very minor injuries.
2. In all cases where the nature of an illness or an injury appears in any way serious, every effort shall be made to contact the parent and/or family physician immediately.
3. No student who is seriously ill or injured shall be sent home alone, nor shall a student who is ill or injured be taken home unless someone is there to receive him.
4. In extreme emergencies, the school nurse/school doctor/or principal may make arrangements for immediate hospitalization of injured or ill pupils, contacting parent or guardian in advance if at all possible.
5. The teacher or other staff member to whom a student is responsible at the time of the accident shall make out a report on an official form, providing details about the accident. This shall be required for every accident.
6. Accidents requiring medical attention shall be reported as soon as possible to the superintendent and the Board.

The Board shall be responsible only for providing immediate first aid. All other medical care, and financial responsibility for it, is the obligation of the student or his parents or guardian.

Sample No. 14

The Board of Education of the Vocational Schools in the County of Middlesex

Administrative Offices: 112 Rues Lane, East Brunswick, N. J. 08816

Accident Report Form

School Insurance *Yes* ☐ *No* ☐ Date_____

Name of pupil injured _____ Age _____

Address _____

Name of parent or guardian _____

Address _____

Date of accident _____ Hour _____ a. m. p. m.

Name of school _____

Where on premises did accident occur? _____

Where taken after accident? _____

Probable length of disability? _____

Nature of injury _____

What was the direct cause and how did accident happen? Describe fully: _____

Has any claim been made? If so, by whom? _____

ALL ACCIDENTS REQUIRING MEDICAL ATTENTION SHOULD BE REPORTED BY TELEPHONE IMMEDIATELY TO THE DIRECTOR, USING THIS FORM AS A GUIDE AND THE FORM SHOULD BE MAILED TO THE DIRECTOR THE SAME DAY THAT ACCIDENT OCCURRED.

Was accident caused by negligence of injured person? _____

_____ If so, please explain. _____

_____

_____

Was accident due to negligence on part of any other persons? _____

_____ If so, how? _____

_____

_____

What statement, if any, has injured person made? _____

_____

_____

_____

Who was in charge of class or shop where accident occurred? _____

_____

What statement does person in charge make? _____

_____

_____

What medical attention, if any, did injured person receive? _____

_____

_____

_____

By whom treated? _____

Address _____ Telephone _____

Names of witnesses: _____

_____

_____

_____

Signed _____
Principal

NJDE 623-8 (11/77)

DIVISION USE ONLY
County Code_____
LEA Code_____
School Code_____

STATE OF NEW JERSEY
STATE DEPARTMENT OF EDUCATION
DIVISION OF VOCATIONAL EDUCATION

MIS 07D007

Sample No. 15

ACCIDENT REPORTING FORM FOR VOCATIONAL EDUCATION COURSE/PROGRAM/ACTIVITY

INSTRUCTIONS:

1. Complete information and submit form within five (5) working days after the occurrence of the accident.
2. Only accidents requiring treatment by a licensed medical doctor are to be reported to the Division of Vocational Education.
3. The original report should be sent to:
   Director, Facilities/Equipment and Safety Control
   Division of Vocational Education
   New Jersey State Department of Education
   225 West State Street
   Trenton, New Jersey 08625
4. The first copy should be sent to the appropriate County Superintendent of Schools Office.
5. The second copy should be sent to the student's sending district, if appropriate.
6. The last copy should be retained by the originating school district.

SCHOOL INFORMATION

School Name_____

School Address_____

District_____

Telephone Number (Area Code ·)_____

PERSON INJURED_____ SEX ___M ___F
LAST FIRST MIDDLE

GRADE LEVEL_____ AGE___ STUDENT_____ INSTRUCTOR_____ OTHER_____ (Specify)_____

INJURED PERSON SENT TO_____ HOSPITAL_____ PHYSICIAN

DATE OF ACCIDENT_____ TIME OF ACCIDENT_____A.M. _____P.M.
MONTH DAY YEAR

LOCATION OF ACCIDENT IF OTHER THAN SCHOOL ADDRESS ABOVE:

_____

_____

_____

TYPE OF VOCATIONAL COURSE/PROGRAM/ACTIVITY

*___Agriculture/Agribusiness/Natural Resources
*___Business Education
*___Cooperative Education
*___Consumer and Homemaking Education
*___Distributive Education
___Employment Orientation
*___Health Occupations
*___Home Economics Related Occupations
*___Introduction to Vocations
*___Industrial Arts
*___Technical Education
___Technology for Children
*___Vocational-Industrial Education
*___Work Study
___WECEP
*___Vocational Student Organizations
**___Other(Specify)
**_____

*Provide specific title of course, program or activity_____

[523-8 (11/77)]

MIS 07D007

PART OF BODY INJURED

___Abdomen
___Ankle
___Arm
___Back
___Buttocks
___Chest
___Collar-Bone
___Ear
___Elbow
___Eye
___Face
___Finger
___Foot
___Hand
___Knee
___Leg
___Mouth
___Neck
___Nose
___Ribs
___Scalp
___Stomach
___Throat
___Teeth
___Wrist
*___Other

*SPECIFY_____

APPARENT NATURE OF INJURY

___Abrasion
___Amputation
___Asphyxiation
___Bite
___Bruise
___Bump
___Burn
___Concussion
___Cut-Laceration
___Dislocation
___Fracture
___Poisoning
___Puncture
___Scalding
___Scratches
___Shock(electric)
___Splinter
___Sprain
___Sting
*___Other

*SPECIFY_____

CAUSE OF INJURY

___Struck Against
___Struck By
___Fall from Elevation
___Fall from Same Level
___Caught In, Under, Between
___Rubbed or Abraded
___Overexertion
___Other(Specify)_____
___Contact with Electric Current
___Contact with Caustic, Toxic, Noxious Substance
___Contact with Temperature Extremes

DEGREE OF INJURY

___Non-Disabling
___Temporary Disability
___Permanent Disability
___Death

NARRATIVE (Briefly describe how accident occurred indicating conditions, actions, tools and equipment involved.)

_____

_____

_____

_____

_____

COOPERATIVE EDUCATION ACCIDENTS ONLY

Was Student Covered By	YES	NO
Working Papers	___	___
Training Agreement	___	___
Workman's Compensation	___	___

Student's Job Title:_____

_____

ACCIDENT REPORT COMPLETED BY:

Name_____

Title_____

Telephone Number_____

Date_____

*Signature of Principal or Superintendent

*_____

Date_____

CHAPTER VIII

METHODS TO BE USED TO PROVIDE SAFETY EDUCATION TO STUDENTS

A. Safety Director and Teachers

The safety director will fully expect that shop teachers at all levels will be creative and continuous in their efforts to include safety instruction in the daily curriculum for their students. Safety inspections revealing unsafe conditions will result in an immediate investigation by the safety director or the supervising administrator. The success of the shop student safety program rests with the ability of teachers to continually instill concepts of safe conduct in the shops.

B. Safety Council Chairperson

The annual budget provides for a Safety Council Chairperson in each school. The chairperson's duties and responsibilities are covered by Board Policy and include the following:

1. Organizes and supervises a teacher-student committee which periodically examines all school facilities for the existence of hazardous conditions.
2. Guides students in the writing of reports detailing specific recommendations arising out of committee inspections. Reports are to be submitted to the teachers and students responsible for the area and the school administration.
3. Schedules follow-up inspections to determine if recommendations have been implemented.
4. Organizes and supervises a student safety court which conducts hearings on individual safety violations.
5. Promotes school-wide safety by planning and implementing on-going student-faculty involvement by such means as contests, displays, films, freshman safety orientation and similar activities.

C. Weekly Safety Lessons

In addition to constant attention to safe practices in the performance of all tasks, each shop teacher devotes *at least* one period weekly to a formal lesson on safety. For this, a lesson plan is required and should be reviewed by the principal or shop supervisor. (Sample No.16)

D. Safety seminars for faculty and staff are also scheduled periodically. (Sample 17)

E. Films and slides are available from the school library (Sample No. 18)

F. Fire drills are scheduled regularly in both day and evening school in accordance with school law. (Samples No. 19 and 20) Bus-evacuation drills are also scheduled regularly. (Sample 21)

G. New students are indoctrinated in safety in each shop during the exploratory program. AV presentations, handouts, tests, etc. are part of each exploratory program. (Sample No. 18)

In addition, English teachers are encouraged to make safety a part of the English curriculum by having students – particularly freshmen – develop safety handbooks for their chosen shops. (Sample No. 6) Evaluation should follow the project. (Sample No. 7)

H. In safety court, students whose offenses indicate they need to learn why certain acts are dangerous, are required to write an essay on the subject of safety. (Sample No. 23) Field trips to a local court are recommended for student safety council members. (See page 19, "Here Come de Judge")

I. Safety advisors are encouraged to attend conferences and report back to the faculty. See Sample No. 24 for a sample report.

J. A student's handbook is given to all students at opening day of every school year. In addition to describing routine procedures, considerable space is allocated to health and safety (Sample No. 25)

K. National Safety Council literature specific to individual shops forms the basis for discussion and testing (Sample No. 26) Similarly, literature available from other sources, such as the students' insurance carrier, is also used. (Sample No. 27)

L. Instructional techniques for teachers and special releases are distributed regularly. (Sample No. 28)

Sample No. 16

LESSON PLAN

SUBJECT: *Diesel*

Lesson: *Jacks–Lifting–Cranes* Unit: *Safety*

I. OBJECTIVES: (Student Will Be Able To —)

1. SWBAT list 6 safety rules for lifting objects.

2. SWBAT list 8 rules for safe use of jacks and portable cranes.

3. SWBAT safely lift a truck front end using a floor jack.

II. PREPARATION

A. Teacher: supplies, equipment *hand-out*

crane, jack

books, references, instructions sheets *"Diesel Mechanics", page 367*

B. Student: Introduction, motivation *What is a slipped disc?*

Connection with previous lesson *Safety meeting*

III. PRESENTATION

Have students read rules out loud.

Hold class discussion on rules.

Show how to jack front of K.W.

What to check for.

IV. SUMMARY

Ask question on lifting (why bend legs?).

Go over jacking instructions for large vehicles.

V. APPLICATION

Assign students to jack truck.

Have other students watch.

VI. TESTING

Safety test

Sample No. 17

PRINCIPALS' SAFETY SEMINAR QUESTIONNAIRE

If possible, please fill in and return the completed questionnaire before you leave today.

This is necessary if our first seminar, scheduled for November 14, is to be successful.

Your cooperation will be very much appreciated.

Cy Sommer, Shop Supervisor

Please put an X in the appropriate box below – or write in your response in the blank space.

	Yes	No	No preference
1. Do you believe that a series of two Safety Seminars can be effective in increasing student awareness of the need for safety?			
2. Do you believe that a series of two Safety Seminars can be effective in increasing teacher awareness of the need for safety?			
3. Do you believe that we should have a speaker from industry?			
4. Have you any other suggestions for a speaker? (Use other side)			
5. Would the following scheduling be acceptable to you? a. First Seminar – Nov. 14 at Coe school. All schools. 1:00 p.m. b. Second Seminar – March. Each school separately (or possible combinations of schools at principals' discretion)			
6. Do you favor joining the National Safety Council?			
7. Do you favor an English class activity in which all students in all schools would be involved in working (in teams or individually) in a Shop Safety Manual Contest?			
8. Do you think other areas besides shops should be emphasized, such as locker room, bus, halls, gym?			
9. Do you believe a "kick off" assembly program for students would be desirable?			
10. What time limit would you set on having the completed booklets turned in and the best one submitted for judging? a. one week ☐ c. one month ☐ e. other b. two weeks ☐ d. two months ☐ _____			
11. Would you be able to arrange a "kick-off" assembly program for students in your school before Nov. 14?			
12. What other activities would you suggest (having in mind the Nov. 14 target date for first seminar)? Please use other side.			
13. P.A. ☐ N.B. ☐ Wdg. ☐ E.B. ☐			
14. Do you agree that the Safety Adviser in your school should be the coordinator of the program?			

Sample No. 18

TO: ALL INSTRUCTORS
FROM: JOHN CZAHOR, SAFETY ADVISOR
DATE: SEPTEMBER 15, 1976
RE: NEW A.V. SAFETY MATERIALS AVAILABLE

Listed below is the total of A.V. materials in our library on safety. Please feel free to borrow them.

GENERAL SHOP SAFETY C. 1972

35 mm color filmstrip and cassette
Illustrates personal safety rules for machinery and chemicals in the shop. Makes reference to the use of colors in accordance with national codes, clothing, tool edges, classes of fires, chemical handling, plastics use.

SAFETY SHOP SERIES C. 1975

Includes 6 titles of 35 mm filmstrip and 6 cassettes

1. SAFETY IN THE SHOP – GENERAL
2. SAFETY IN THE WOOD SHOP
3. SAFETY IN THE METAL SHOP
4. SAFETY IN THE ELECTRONICS SHOP
5. SAFETY IN THE AUTO SHOP
6. SAFETY IN THE MACHINE SHOP

Guide includes synopsis, background information, learning objectives, evaluation, and suggested activities for each of the 6 titles.

INTRODUCTION TO WOODSHOP/CARPENTRY SAFETY C. 1975

1. 35 mm color filmstrip and cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

INTRODUCTION TO AUTO SHOP SAFETY C. 1975

1. 35 mm color filmstrip and cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

Beginning information which would also be valuable for small-engine program.

SAFETY: MACHINE & POWER TOOLS C. 1972

Includes: 48 Transparencies
Instructor's guide

Each transparency sets forth safety rules relating to a specific tool. Material covered: stationary power tools, machine tools, and portable power tools.

OXYACETYLENE WELDING SAFETY KIT C. 1974

Includes 79 slides plus 2 tapes.

Covers oxyacetylene apparatus, supply and welding.

Requires workbook, which is on order.

OXY-ACETYLENE WELDING SAFETY C. 1975

PART 1 and PART 2

Each part contains:

1. 35 mm color filmstrips and 1 cassette.
2. 30 test sheets.
3. Answer sheet.
4. Instructor's guide.

ARC WELDING SAFETY C. 1975

1. 35 mm color filmstrip and 1 cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

INTRODUCTION TO MACHINE/METAL SHOP SAFETY C. 1975

1. 35 mm color filmstrips and 1 cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

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4. SAFETY IN THE ELECTRONICS SHOP
5. SAFETY IN THE AUTO SHOP
6. SAFETY IN THE MACHINE SHOP

Guide includes synopsis, background information, learning objectives, evaluation, and suggested activities for each of the 6 titles.

INTRODUCTION TO WOODSHOP/CARPENTRY SAFETY C. 1975

1. 35 mm color filmstrip and cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

INTRODUCTION TO AUTO SHOP SAFETY C. 1975

1. 35 mm color filmstrip and cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

Beginning information which would also be valuable for small-engine program.

SAFETY: MACHINE & POWER TOOLS C. 1972

Includes: 48 Transparencies
Instructor's guide

Each transparency sets forth safety rules relating to a specific tool. Material covered: stationary power tools, machine tools, and portable power tools.

OXYACETYLENE WELDING SAFETY KIT — C. 1974

Includes 79 slides plus 2 tapes.

Covers oxyacetylene apparatus, supply and welding.

Requires workbook, which is on order.

OXY-ACETYLENE WELDING SAFETY — C. 1975

PART 1 and PART 2

Each part contains:

1. 35 mm color filmstrips and 1 cassette.
2. 30 test sheets.
3. Answer sheet.
4. Instructor's guide.

ARC WELDING SAFETY — C. 1975

1. 35 mm color filmstrip and 1 cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

INTRODUCTION TO MACHINE/METAL SHOP SAFETY — C. 1975

1. 35 mm color filmstrips and 1 cassette.
2. 30 test forms (please reproduce).
3. Answer sheet.
4. Instructor's guide.

FIRE DRILLS

Fire drills are compulsory. Each shop should select a Fire Safety Squad from its own group as early in the school year as possible.

Fire Chief – Duties would be outlined by the Shop Instructor or the Principal.

Assistant Fire Chief – Duties would be to assist the chief, and to replace him or her when absent.

Captains – they would be in charge of various sections of the buildings or certain floors.

Room Marshalls – at least two for each shop or room. One of them would lead the class to the outside – following the designated plan of procedure – if conditions permit. The other would (with an assistant) close the windows, make sure that all the power is shut off, that the room is evacuated, and that all connecting and outside doors are closed but not locked. After each fire drill, teachers should report to the principal any observed conditions that might be regarded as potential hazards.

Every student should learn the location of the fire extinguishers and other fire-fighting equipment, and also how to use them properly. Students should know which exits they have to use in order to leave the building.

FIRE DRILL PROCEDURES FOR EVENING SCHOOL

ANNOUNCED FIRE DRILL PROCEDURES AT 9:50 P.M.

From time to time we have fire drills to practice quick evacuation from the building, using the nearest exit.

Please follow this procedure:

1. Clean up shops or classrooms in preparation for the pending fire drill. Notify students not to return to class. They may leave in an orderly manner for the evening only at the sound of the fire alarm.
2. Close and lock all windows. Leave the shop or classroom in the same or in better condition than you found it.
3. Put out the lights and lock the door.
4. Sign out; turn in your key and class register.
5. Keep the principal informed of anything unusual that may have occurred.

UNANNOUNCED FIRE DRILL PROCEDURES:

1. Fire alarm signal.
2. Leave the building immediately with your students and class register.
3. When you arrive at your assigned area take roll call —– should someone be missing, notify the principal immediately.
4. All clear signal —– return to shop or classroom.
5. Keep the principal informed of anything unusual that may have occurred.

Sample No. 20

Middlesex County Vocational and Technical Adult Evening Schools

Monthly Fire Drill Report

DATE:_____ TIME:_____

COMMENTS:

DATE:_____ TIME:_____

COMMENTS:

_____
Principal

Attach to monthly attendance reports

Sample No. 21

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOLS

H. BUS EMERGENCY EVACUATION DRILL

Date:_____ Time:_____

1. Vehicle License Number:
2. Driver's Name:
3. Contractor:
4. School District:
5. Supervisor of Drill:
6. School:
7. Comments:

Principal_____

Sample No. 22

MIDDLESEX COUNTY VOCATIONAL & TECHNICAL HIGH SCHOOL

Safety Information for New Students in the Machine Shop

DIRECTIONS: After the students have read the following safety information, the shop teacher will discuss each item with them in detail. The teacher will give such preliminary demonstrations in the correct and safe operation of machines, tools, and other equipment as are necessary for a new student to know before operating or using equipment in the machine shop.

1. **Fooling**

   There must be no fooling, running or horseplay of any kind in the shop **at any time.** Students while fooling, may run or fall against vises, projecting parts of machines, or other students who are operating machines, causing injury to themselves and others. Fooling with the air hose is particularly dangerous. At no time must the air hose be turned on or directed toward a fellow student. Serious injury may result from the careless use of the air hose in the shop.

2. **Oil or Grease on Floor**

   Oil or grease dropped on the floor must be wiped up at once. Neglect of this precaution may result in someone's slipping, with resulting injury.

3. **Proper Shop Clothing**

   Loose ties must not be worn when operating machines. Shirt sleeves must be rolled up. Hard hats must be worn in the shop at all times. Long hair must be tucked in back of the ears. A shop apron, tied at the back, should be worn to protect the clothing. Neglect of these precautions may result in injury.

4. **Students Should Not Wear Sneakers**

   Sneakers are no protection against slippery or oily floors, falling objects, or the edges of metal. Regular shoes should be worn by students.

5. **Hand Tools**

   Never use a hammer if the head is loose on the handle. The head may fly off and hit another person. Never use chisels or punches that have mushroom heads. Chips may break off the heads of tools and may cut the hands or hit another person. Never use a file without a handle. The bare tang of the file may inflame the hand or, if jarred out of the hand when used on machine or bench work, may cause serious injury. Never hit the vise with the file – splinters may fly off.

6. **Use of Step Ladder**

   Never stand on a machine to oil the countershaft or repair belt. Use a step ladder. Neglect of this may result in injury by slipping or falling. Never move a step ladder until all tools have been removed from its platform or upper step. Neglect of this precaution may result in tools falling and injuring worker or other persons.

7. **Distracting Student's Attention While Operating Machines**

Never distract another student's attention by unnecessary talking, fooling or "ganging up" around a machine. A serious accident may be caused by neglect of this safety rule.

8. **Materials and Tools on Floor**

Always keep aisles and emergency exits clear of tools and materials. Tools or pieces of metal must not be left on the floor. Always return stock to stock rack. Neglect of the precaution may result in persons' tripping and falling against the machines or benches.

9. **Operation of Machines**

A student must not attempt to start a machine until he has been instructed in its operation. No machine shall be operated or used without the permission of the teacher. Failure to observe these rules may result in damage to the machine and injury to the student.

10. **Use of Cotton Waste and Rags**

Oily waste and rags must not be left lying around on benches or machines but must be placed in metal containers provided for that purpose. Never allow oily waste or rags to accumulate. Neglect of these precautions may result in fire (spontaneous combustion). Never use waste for cleaning machine beds, as it collects metal chips which may cause cuts on the hands. Use a brush for this purpose.

11. **Machine Belts**

Do not throw off belt with the hand. Use belt stick provided for that purpose. Failure to use belt stick may result in metal hooks of belt tearing fingers, or hand getting caught between belt and pulley.

12. **Use of Fire Blanket**

A fire blanket is in a convenient place in the shop to be used in emergency when clothing has caught fire. Pull the blanket from the container and wrap around the person to smother the flames, taking care not to cover face.

13. **Reporting Injuries**

In case a student receives an injury (no matter how small) s/he must report it at once to the teacher, who in turn will send her/him to the medical room for proper treatment. Neglect of this rule may result in infection and serious trouble to the student if injury is neglected.

14. **Metal Chips**

Never handle or pull chips from the lathe, drill press, or any other machine with the fingers. The curlings or chips are hot and sharp and will injure the hands. Use a brush, pick, or hook to remove chips, etc.

15. **Guards on Machines**

Never operate machines where guards are not in place; all machines are guarded wherever possible. Where it is impossible to guard working parts of machines in order to operate, exercise extra care around these unguarded parts. Attention to these precautions will prevent accidents from revolving gears, pulley belts, etc.

16. **Safety Goggles**

Safety goggles are provided and must be worn by students on all operations on machines where there is danger from flying particles of emery dust or wheel breakage. Failure to use goggles may result in serious injury to the eyes. On such machines which are equipped with glass shields, be sure shields are properly adjusted before operating.

17. **When Chipping Metal**

Always use safety goggles when chipping steel or other metals and always chip toward the wall. Observance of this rule will avoid injury to the worker's eyes, and will prevent injury to other persons from flying chips.

18. **Handling Heavy Metal**

Never overlift. When required to move or lift heavy steel or heavy pieces of machine equipment, a student should obtain assistance. Neglect of this precaution may result in back strain or other bodily injury.

19. **Electrical Switches**

Electrical switches are guarded in every possible way. Use care in handling starting and stopping devices. Do not touch any exposed part of the switch. Electrical shock and burns may result if the hands come in contact with live wires of connections. Do not fool with an electrical switch.

20. **Gas Furnace**

A student must not operate gas furnace without receiving instruction in its lighting and operation. Carelessness or ignorance may cause an explosion. Never stand in front of furnace when lighting it. Stand to one side.

21. **Electric Furnace**

Do not operate this furnace until instructed in its use and operation. The electric furnace must be handled carefully. Tongs must be used to prevent hands' coming in contact with the pieces being heated. The furnace hood must be kept closed to prevent the heat from escaping.

22. **Power Machines**

a. Drill Press: Do not hold a piece of work with the hands while drilling, as it is liable to be pulled away suddenly, causing injury by cutting or bruising the hands. Always use a vise, clamp, or table strap.

b. Engine Lathe: Keep the hands and arms clear of the revolving work. Do not place or slide the fingers on or over revolving work, spindle, chuck; etc., while the lathe is in motion. Neglect of these rules may result in injury.

c. Milling Machine: Do not oil, brush the chips, or measure the work while the machine is in motion. Fingers may catch in the revolving cutter if this precaution is neglected.

d. Surface Grinder: Never operate surface grinder without the proper protection of wheel guard. Failure to use guard may result in serious injury to operator or others if grinding wheel should break. Students should wear safety goggles to protect the eyes.

e. Utility Grinder: Be sure the guard rests are properly adjusted. Failure to do this may result in severe injury to fingers or damage to grinder if work should slip from your fingers and become wedged between emery wheel and wheel guard.

f. Cut-Off Saw: Be sure to clamp material securely in vise before starting machine. Failure to do this may result in injury to hands and eyes due to broken saw blades.

Sample No. 23

Excerpt From Student's Safety-Court Essay

You know you think I would be the last peson in the world to live dangerously with my eyes because when I was in 9th grade, in July I think. I saw a movie on a eye operation. This man was a machinist a highly skilled one, and he forget his saftey glasses one day he figured why lose a hars pay to drive home a get his glasses, so he went to work with out them. He was fine until abaut a hour before quitting time. He was cutting this piece of metel and it sheared on him. A small piece went in to his eye, he rolled on the floor in pain. The ambulance came and took him to the hospital they showed the full operation. the cut his eye lids so they could get to the tiny piece of metel the man had to be fully awake during the whole operation It was grass I said that day you'll never catch me working on a project with out the proper saftey equipment. But I was wrong I made that mistake and was lucky an spark didint go into my eye. By the way after this operation the man went blind and couldnt go back to

Sample 24

COPIES OF THIS REPORT SUBMITTED TO ALL SAFETY ADVISORS.

REPORT ON ONE-DAY SEMINAR ON IMPLEMENTATION OF VO-ED SAFETY STANDARDS

November 22, 1977

Holiday Inn — North Brunswick, New Jersey

The Seminar was a joint effort by the N.J. Safety Council and the Division of Vocational Education.

Preliminary Remarks By:
Richard Callan, Director of Industrial Arts
William Smith, Director of Facilities and Safety Control
William Margeretta, N.J. Safety Council (642-3123 for films, info, etc.)

Topics Included:
- Developing Safety Awareness
- Writing Safety Programs
- Implementation of a Safety Program
- Hazards Identification

Highlights of the four sessions that I attended follow:

1. Be sure to follow *New* Revised Standards.
2. All Shop areas will eventually be covered. So far, requirements have been spelled out only for welding, woodshop.
3. Color-coding standards that have been spelled out apply to all shops.
4. Time line on implementation: Sept. 1, 1978 (Extensions possible with approval)
5. Each system must develop a total program, to be approved by local Board of Education; then forwarded to Bill Smith, Vocational Division.
6. Student Safety Tests can be considered part of implementation.
7. Teacher involvement recommended.
8. Develop a budget for safety.
9. Get information from school insurance carrier.
10. Safety committee should investigate *why* an accident took place.
11. Concentrate on *developing awareness* (a first principle for school policy).
12. Definition: "Safe is when the risk is judged to be acceptable."
13. Compression tanks must be strapped at all time to something solid (like a wall).

14. Use of "Ground Fault Interrupts" highly recommended ($30-40 each). However, these will only indicate the existence of a problem, not correct it.
15. 85% of accidents caused by unsafe *acts;* only 15% by unsafe *conditions.*
16. Insurance premiums based on experience, not on hazards.
17. Ties definitely out for shop.
18. Explosion-proof lighting required in hazardous areas.
19. Check with manufacturer for recommended safe area around machines.
20. Bolting to floor optional – but machine must be "immovable."
21. Brakes on woodworking machines are *recommended* but not required. However, many accidents occur after machine is turned off. Lockouts are desirable on all machines.
22. Empty welding tanks should be kept separate and marked "Empty".
23. Practical demonstration (with wig) of hair being caught in drill press or other machine is effective.
24. Keep Safety Plan easy to read.
    List Hazards.
25. Good idea to have shop teachers evaluate each other. (No report to Principal or Supt.)
26. Building Inspection Sheet to be developed by Building Supervisor and used at regular specified intervals.
27. For further information, contact:

    William R. Smith
    Facility/Equipment and Safety Control
    Division of Vocational Education
    (609) 292-9618

Cy Sommer
Shop Supervisor
Nov. 28, 1977

Sample No. 25

Excerpt From Students' Handbook

SAFETY

The rules of safety will be constantly emphasized in our school. Industry places a premium on safe workers. Many lives are lost and many workers suffer countless injuries when the rules of safety are ignored or flaunted. Our shops are equipped exactly as those in industry. Consequently, student behavior must resemble that of the worker in industry.

You will receive individual instruction in every shop regarding detailed safety rules and regulations. The following are general safety rules:

1. All students, employees and visitors will be required to wear eye-protective devices while the shop or laboratory is in operation.
2. Visitors to more than one shop or laboratory will be provided with eye-protective devices in the main office.
3. Machines should be operated only by those students qualified to do so.
4. Obey warning and danger signs.
5. Horseplay, fighting, wrestling, or childish behavior has no place in this school.
6. Be sure of what you are doing. If in doubt, take no chances; ask your instructor.
7. Loose clothing, flowing neckties, rings and wrist watches can get caught in machinery and cause serious injury. Wear the proper shop clothing.
8. Do not throw objects. Do not run in corridors Outside clothing worn inside the building is a health hazard and is to be discouraged.
9. Report all injuries, no matter how slight, to your instructor.
10. An accident report will be completed for all injuries.

Students who ignore or flaunt regulations will be referred to the Safety Council by teachers. This referral is then reviewed by a safety court made up entirely of students with the assistance of a teacher advisor.

The following applies to students found guilty by the court of safety violations.

1st Violation – made aware of unsafe act and reprimanded by court.

2nd Violation – assigned an essay on a particular safety area.

3rd Violation – recommended in writing to the Assistant Principal for further disciplinary action.

4th Violation – may be transferred to another program, or in extreme cases may be sent back to their home district

FIRE DRILLS

Fire drills are necessary for the safety of the students and faculty. Everyone should know the specific directions for reaching a point of safety from those areas of the building in which he/she may be. For fire drills the information is posted above the door in each room. At all times special instructions may be announced over the loud speaker.

General Rules for Fire Drill:

1. Close windows.
2. Students will follow designated exit instructions, keep in single file, walk, not run, refrain from talking, and proceed to a distance approximately 100 feet from point of exit.
3. The teacher should be the last one out of the room, should take the grade book and keys, should close the door, and remain with the group.
4. The teacher will take attendance once the group has reached its proper distance from the building.
5. When the "all clear" is sounded, all will return to their classrooms in the same orderly fashion.

Note: Fire drills are very important and serious exercises which may save your life. You are expected to act accordingly.

SMOKING

The school does recognize that some students feel that they have a need to smoke. Therefore, a specific area outside of the school building has been designated for smoking. That area is graphically represented on the following page. Students are required to keep this designated area free from litter at all times and to confine their smoking to this area. In order to assist the students in maintaining area cleanliness, the school will provide receptacles.

Smoking will be permitted in this area during designated times. They are before school, after school, and during the student's assigned lunch period. Failure to follow these procedures may result in revoking of privileges and suspension of the individual concerned.

The Administration reserves the right to revoke all smoking privileges if for any reason it is determined that the privileges are being abused, or if any one of the following occurs:

1. If the receptacles are damaged
2. If the area is not maintained
3. If smoking causes excessive tardiness to the students' next class

PARKING OF CARS

Students may park their vehicles on school grounds only in areas designated for student parking. The standard rules of proper use of an automobile will apply at all times. Students who endanger others by improper use of their vehicles will be denied parking privileges. **No student is to use the areas set aside for faculty parking or visitors' parking.**

Permits for Parking – A student must apply to the Assistant Principal for permission to park a vehicle in the student lot. The application forms are available in the office. The application form also lists the requirements that a student must meet in order to obtain a parking sticker.

ALCOHOL AND DRUGS

The use of any alcoholic beverages or drugs is strictly prohibited. Any possession, use or sale of drugs or alcoholic beverages on the school grounds, at school functions or on school buses is prohibited at all times. The rule regarding alcoholic beverages applies to all students, regardless of age. The breaking of this rule may cause the local law enforcement personnel to become involved.

WIPE OUT DRUG ABUSE!

STUDENT HEALTH SERVICES

The administration and faculty at Piscataway Vocational and Technical High School consider this one of the most important sections of your student handbook. Good health is a prerequisite to learning; as a matter of fact, good health is essential to most successful activities.

Following are a few simple regulations which are requested of students in order that we may help to maintain safety and health of all students here at Piscataway.

Student Health Services

The school nurse is available for any student who feels ill or is injured during the school day. Students should report to their classroom or vocational area teacher and then be dismissed to the Nurse's Office with a Hall Pass.

Accidents and Insurance

The school is responsible only for immediate first aid. The Board of Education does not pay any medical or hospital bill incurred as a result of accident to the pupil at school. The parent or guardian is responsible for the payment of such bills.

We urge you to avail yourself of the protection afforded through school insurance. You will be given information regarding various insurance plans during the first week of school.

In the case of an accident, no matter how minor, the student should report that accident to the teacher immediately. In the case of severe accidents or acute illness, emergency care will be given and the parents will be notified.

Medical Transportation

It is the responsibility of the parents to provide transportation and further care of the student if the student becomes ill or injured on school property. Students may not be sent home without parental approval and no student may drive when excused for medical reasons unless parental consent has been given.

Emergency Cards

In order that we conform to the wishes of parents, emergency cards must be filled out for each student and returned to the Nurse's Office for use in emergency situations.

Medications

Students who need medication during the school day should bring only one day's supply with them to the Nurse's Office, properly labeled. Medicine should be taken in the Nurse's Office by the student.

Communicable Diseases

Students returning to school after recovering from a communicable disease must be readmitted through the school Nurse's Office. Communicable diseases are: German measles, measles, mumps, chicken pox, scarlet fever, conjunctivitis (pink eye), mononucleosis.

STREP THROAT PROGRAM

In order to prevent the spread of communicable disease, students with severe colds and sore throats are requested to stay at home and have the parent notify the school of absence. Piscataway Vocational and Technical High School has a program whereby students with any symptom, i.e., earache, headache, cold, swollen glands, stomach ache, running nose, cough, sore throat and upper respiratory infection may immediately be tested for strep infection.

Students with positive throat cultures will be excused from school for at least two days, and will only be readmitted to school with a form provided by the school and signed by a physician indicating treatment.

This program reduces the incidence of strep diseases, thereby reducing strep complications such as: rheumatic fever, heart disease, serious kidney disease, and other possible strep-related diseases.

TUBERCULOSIS TESTING

State Regulations for tuberculosis detection require annual testing in Grades 9 & 12. The test is administered at the beginning of the school year. All students in Commercial Foods and Baking are tested annually.

PHYSICAL EXAMINATIONS

All 9th and 11th grade students, as well as new students at the Piscataway Vocational and Technical High School are required to have a yearly physical examination by the school physician. If, for any reason, the parent or guardian wishes that the student have the examination done by the family physician, a certificate of said examination must be submitted to the school nurse no later than the last week of September.

PHYSICAL EDUCATION MEDICAL EXCUSE POLICY

The policy for all students excused from physical education:

1. If, for any reason, you cannot participate in the full gym program, a note must be brought from home stating same. If this disability extends for more than one week, a doctor's note must be submitted indicating length of time you are to be excused. The note should be recorded and initialed by the Gym instructor and brought to the school nurse for recording and filing.

2. The student is then to report to his or her gym period unless otherwise instructed.

3. Under no circumstances are students with medical excuses allowed to participate in gym activities. Students must remain where assigned unless excused by the teacher in charge.

safety education data sheet number 83

This data sheet was revised for the National Safety Council by Daniel W. Irvin, Educational Director, Power Tool Division, Rockwell International, Pittsburg, Pa.

Safety in the Sheet Metal Shop

MODERN production methods an the increasing demand for comfort and convenience in modern living have challenged industry to develop many new and better products made of sheet metal.

Among those in common daily use are summer and winter air-conditioning units for home and office, new-styled automobiles, new design in airplanes for faster travel, all-metal railroad coaches, metal storm doors and windows for the home, refrigerators, metal desks, lockers and files for home and office.

Because of the increased use of sheet metal, more types of new handling and forming equipment are presenting more hazards to sheet metal work, hazards to which students should be introduced before entering the modern metal working industry.

This data sheet endeavors to bring out general rules applying to areas covered.

Consideration in this data sheet has also been given allied trades, without which no sheet metal shop could function efficiently.

Statistics

Accidents in the School Shop or Laboratory

1. National statistics on school jurisdiction accidents in the sheet metal shop are incomplete and inadequate. However, a composite of available information, listing the areas of industrial education according to comparative rating in frequency of accidents, would appear as follows: woods, 12.0; metals, 11.0; transportation, 6.6; communication, 5.9; graphic arts, 3.3.

2. In the metals area, *the frequency of accidents in the machine shop is higher than in all other shops combined.* Exposure may be an important reason for this and must not be overlooked. The general metal and sheet metal shops rank second and third, but with far fewer accidents.

Accidents in the Industrial Shop

3. A report on the frequency of injuries in

NATIONAL SAFETY COUNCIL
444 N. MICHIGAN AVE., CHICAGO, ILL. 60611

Safety in the

safety education
data sheet
number 83

industry caused by machines and their severity, covering a five-year period, was made by the Massachusetts Industrial Commission. The report appears at the bottom of the page.

4. Other accidents caused by objects falling on feet, cutting hands when handling metal, falling over objects thrown on the floor, and numerous other acts of carelessness for which no statistics are available, would surpass those caused by machine tools and metal forming machines combined.

The Problem

5. Since safety is so vital in the conduct of any sheet metal shop, safety rules should be carefully explained and strictly enforced by the shop instructor, and observed by the student. Both parties are equally concerned, because an injury resulting in loss of time is a detriment to both student and instructor. Instructors should stress to students that intelligent observation of safety rules protects their ability to gain useful trade knowledge which can be of value in their economic future.

6. Students should learn and always remember that safety in the metal shop depends on teamwork in which each person is dependent upon careful and conscientious adherence to safety provisions by his fellow worker. Therefore, the work of each person has a direct effect on the safety and security of all the others working in the shop.

7. Safe practice in sheet metal work includes:
   a. General safety rules
   b. Protective equipment
   c. Safety guards used in power-driven machinery
   d. Cutting and forming metal with hand tools and machine tools
   e. Hand riveting and pneumatic riveting
   f. Forging angle rings and other structural shapes
   g. Welding seams and joints by both the electric and acetylene welding methods
   h. Field erection work and sketching which involve the installation of safety guards, duct work and equipment
   i. Soldering.

General Safety Rules

8. All protective devices for a particular job *must* be used, and *never* must anyone tamper with a safety device in any way.

9. Floor space must be kept free of tools, metal trimmings and refuse.

10. Students must wear a shop apron, tied in the back or other protective clothing. Long hair must be held in place so that it won't get caught.

11. Accidents must be reported *as soon as they*

Disability distribution per 1,000 injuries and average number of days lost per temporary total injury by type of metal-working machine causing the injury.

Type of Machine	Disability Distribution per 1,000 injuries			Average number of days lost per Temporary Total Injuries
	Fatal and permanent, total	Permanent, partial	Temporary, total	
Metal Working Machines				
Metal Forming Machines				
[illegible] Metal Forming				
[illegible]es	(1)	292.24	707.75	30.14
Hammers	(1)	245.61	754.38	(1)
Presses & Punches	(1)	314.33	685.66	30.68
Rolls	(1)	140.84	859.15	27.88
Shears	(1)	203.12	796.87	26.64
Machine Tools				
Abrasive Wheels	2.50	74.22	923.26	17.74
Circular Saws	(1)	155.17	844.82	(1)
Drills	(1)	57.25	942.74	26.41
Polishing and buffing	3.47	41.66	954.86	20.32

(1) Rate not shown because base is less than 50.

occur. Get proper first aid for any injury.

12. Running is absolutely prohibited in the shop. Students should always walk. Any horseplay cannot be condoned.

13. A student who is over-tired or not feeling well should avoid operating a machine.

14. "Out of order" signs or other clear indication of disrepair should be posted on machines that are not working, and no one should use them until they have been repaired.

15. No one should walk or work under a loaded crane.

16. In operating sheet metal working machinery, the operator stands away from the counterweight on the brake.

17. Fingers should be kept clear of the apron and head when using the brake.

18. Loose clothing, long sleeves, gloves or a necktie should *never* be worn while operating rotary machines or the drill press. Neckties should be removed or tucked in well, sleeves should be rolled above the elbows, rings and wrist watch should be removed.

19. Hands must be kept free of the dies or punches when using the punch press. Tongs should be used to handle the work.

20. The student *must* keep his mind on his work. Day-dreaming and inattention cause most of the accidents. Distracting another student while he is working at a machine may also cause serious injury. Strict attention to the job at hand is necessary to prevent accidents.

Protective Equipment

21. Always wear safety goggles when working on the band saw, grinding, chipping, forging, brazing, dipping metals in acids or transferring acids and corrosive liquids from a bottle to a container. Special safety goggles must be worn when welding or working near welders.

22. Leather gloves with a gauntlet must be worn for welding.

23. Rubber gloves must be used for handling acids and corrosive liquids.

24. Work gloves of leather or cotton are needed for handling rough castings or newly sheared metals.

a. Students should be instructed in the proper way to handle sheet metal. They should be warned against allowing the sheet metal to slide through their fingers.

b. Sheet metal should not extend into the aisles from the benches.

c. Stakes should be handled carefully and stored to provide protection from pointed ends. They should not be left lying around.

d. "Corner guards" should be provided.

25. *Never* should gloves be worn when operating any rotating equipment.

26. Proper tongs should be used for handling hot metals. Gloves cannot be depended upon for complete protection.

27. When welding, working with a burner or any hot or molten metals, the student must learn to protect himself with a leather apron and leather gauntlets.

Safety Guards Used on Power-Driven Machinery

28. All exposed belts and drives should be guarded. Money spent on guards is a profitable investment. It more than compensates for the cost of a single serious injury.

29. The machine operator should never repair his machine. This is the work of a machine repair man.

30. Local standard safety codes should be followed in the design of safety guards.

31. Safety guards must be firmly fastened to machines or floor with sufficient clearance between the pulleys and the guard to prevent the belts from coming in contact with the guard. Loose guards or guards with insufficient clearance are safety hazards.

Cutting and Forming with Machine and Hand Tools

When Operating the Band Saw

32. There is always a danger that the saw blade may break. This can be caused by forcing the work beyond the capacity of the saw or by a poor splice. The material used for the wheel enclosure guard should be heavy enough to contain a broken saw and equipped with covers to make blade replacement easier.

33. Trimmings should be disposed of immediately after cutting.

34. When cutting a small piece or strip of metal on the band saw, the work must be held with another piece of metal or in a jig.

When Operating the Drill Press

35. Guards at the work point are not practical on machines with revolving tools, such as a drill press. Loose sleeves, gloves and long neckties should never be worn. Work should always be clamped when boring or drilling; never held by hand. Long metal shavings are dangerous and should be cleared up immediately with a brush.

36. A chuck key for removing drills should be attached to the machine for ready use. It should be removed from the chuck before the

machine is started. Never should a file handle and hammer be used to remove drills.

37. The electric shut-off switch on a drill press should be placed in an easily accessible position to the operator.

38. The following should be checked before proceeding with work: correct speed, correct bit, work clamped to the table, belt guard replaced, chuck key removed.

39. The drill should not be allowed to fall when it is removed.

40. The machine must be stopped if any adjustments are to be made.

Metal Shears

41. The squaring shear, common to all sheet metal shops, is the cause of many disabling injuries, particularly amputations of fingers.

42. A barrier guard constructed of expanded metal or plastic set less than the thickness of the fingers above the flat surface of the shear, will make it impossible for the operator to reach under the knife. The hold-down device, which descends as a holding clamp, should be positioned between the knife and the guard to protect the operator's fingers from being pinched by the holding clamp.

43. An operator should *never* reach over the shear to catch small pieces being cut off. Let them drop to the floor.

44. When two operators are required to handle material being sheared, the operating mechanism should require that both operators' hands be on the controls before shears can be tripped.

45. The circular shear is the least hazardous of the metal shear equipment. If required, a semi-circular guard can be installed around the top cutting blade with a minimum of clearance to permit safe operation.

46. The shear should be locked when the student has finished using it.

47. Keep feet clear of foot treadle.

Metal Brake

48. Metal brakes can be manual, hydraulic or electric. The accident hazard common to the sheet metal brake is pinching the fingers. An adjustable top table, which will place the metal on a level with the jaws of the brake and permit the operator to adjust the metal readily to the required braking line will aid in the elimination of this hazard.

Cold Metal Rolls

49. This group of metal forming machines consists of two or more individual rolls and is used for bending, crimping, corrugating, knurling or otherwise changing the shape of thickness of metal. Rolls present a much smaller hazard than other cold metal forming machines because of their slower speed.

50. The most frequent cause of accidents in operating this type of machine is having the clothing of the operator drawn into the rolls. The best prevention against such accidents is not to wear loose clothing when operating this type of machine. The machine control should be placed as near the run-in point as possible, so that the operator can stop the machine if his clothing gets caught in the running rolls.

Cold Metal Forming Hammers

51. Cold metal hammers have a bad accident record, the most hazardous of which is the changing of dies. When changing dies it is good safety practice to block up the hammer with heavy pieces of timber and use an adjustable top table so that the die can be slipped into place without lifting.

52. Stop the machine and lock it out to clean, oil, adjust or repair it. Place a "Danger—Do Not Start" sign on the switch box.

53. Fingers should be kept outside of the guard while operating the hammer.

54. When the die is in the punch press, tongs or hooks should be used to remove the work. *Hands should never be placed between the dies.*

Grinding

55. Before using a portable grinder, condition of the spindle, grinding wheel, recommended wheel speed, and electrical connections should be checked.

56. Whenever possible, a screen should be used to protect others from flying chips and particles of the wheel. Safety goggles should always be worn when grinding.

57. The hands should never touch the grinding wheel or disc.

58. When working on the grinder, gloves should never be worn, nor should the work be held with a cloth. Either of these might get caught in the machine, with sad results.

59. The student should stand to one side of the wheel when turning on the grinder.

Drills

60. Check to see that the spindle, electrical connections and drill point are in good condition before working with the drill. Be alert for breaking drills.

61. Never force a drill. If it should jam, the

resulting "kick," on the larger sizes, can sprain or fracture a wrist.

62. Keep hands away from the front of a revolving drill.

63. Always support a portable drill with one hand, resting the supporting hand against the metal being drilled.

64. To prevent the chuck end of a snake drill from whipping, support it with the right hand. Do not release the hand until motor stops.

65. Gloves should never be worn when operating a drill.

66. Do not try to tighten a drill in the chuck until the spindle stops.

67. Get the drill started in the hole before you throw on the automatic feed.

68. Be slow and cautious when a drill is breaking through a piece. Withdraw the drill and clean out the chips frequently when a drill has entered work beyond the flutes.

Hand Tools

69. Mushroom-headed punches, sets, drifts and chisels should be exchanged for tools in good condition or the head reground. *Never* use a mushroom-headed tool.

70 Don't use a hammer with a chipped face or a cracked or splintered handle.

71. Always check to see that hammer handle and wedge are tight.

72. Any edge tool should be carried with the sharp edge *down*. Pointed tools should be held with the points down.

73. Keep sharp or pointed tools out of the pockets.

74. Use tongs to hold objects which you are hammering or pounding.

75. It is unsafe to use a monkey wrench as a hammer. Use the correct tool for the job.

76. Never use a file without a handle.

Hand Riveting and Pneumatic Riveting

77. Guard against shooting the riveting gun by accident. Keep your finger behind the trigger and point the gun to the floor when not using it.

78. When rivet sets become too short for safe use, discard them.

Forging Angle Rings and Other Structural Shapes

79. Be sure that you're using the right size and type of tongs for the job.

80. The student must always use cool tongs. They should be cooled frequently to avoid danger of burns.

81. Never hammer on cold steel. It may split or crack.

82. It is very easy to break two pieces of hardened steel by striking them together.

83. Tools should be kept sharp at all times. Never work with dull equipment.

84. Check to be sure that the handles on all tools are tightly secured before using.

85. Goggles should always be worn for grinding.

86. Never lay hot iron on a tool bench, where someone might pick it up.

87. Always look to see that no one is passing behind or beside you before you swing a sledge hammer. Check overhead clearance of swing.

88. Always open the doors of a gas furnace before lighting it. There may be a leak.

89. Keep the floor free of tools and scraps.

Welding Seams and Joints by the Electric and Acetylene Methods

90. A leaking tank should be removed from the building immediately to avoid an accumulation of explosive gas.

91. All hose connections should be made with the proper clamps or connectors. A wire should never be used for this purpose.

92. No one should weld in or near a room which contains flammable vapor resulting from dipping or spraying.

93. Sweep wood floors clean, wet them down, and, whenever possible, cover them with a metal protector before beginning to weld over them.

94. If slag or sparks can drop through the floor, make certain that the floor below contains no combustible material. Make sure other persons are not in that area.

95. Use sheet metal guards, asbestos blankets or asbestos curtains wherever they are needed to confine slag, sparks and glare to the immediate vicinity of the welding.

96. Gas given off by welding on galvanized material is hazardous. Proper ventilation must be obtained for protection against these fumes.

Gas Cutting and Gas Welding

97. Under no circumstances should anyone work alone in tanks or boilers.

98. Under no circumstances should anyone start to cut or weld tanks of any size or description without first determining whether dangerous gases or dust are in the tank. Blow tank out with steam until the tank is thoroughly

heated by the steam. Acid tanks should be thoroughly rinsed several times to prevent formation of hydrogen. Always examine the inside of the tank first with a flashlight or safety type electric light. Also check what is on the other side of the object before using a cutting torch.

99. When a weld or cut is complete, quench the work before leaving or mark it to show that it is still hot.

100. Never use a cylinder, empty drum or barrel as a support for your work.

101. Always wear safety goggles when you are grinding or chipping.

102. Examine the hose carefully for leaks, cuts and worn places at least once a week. Place it under normal working pressure, immerse it in a bucket of water and observe carefully for bubbles. Gathering bubbles indicate a leak: the faulty section should be removed and hose re-spliced using a standard connector.

Oxygen Cylinders

103. Use no oil or grease near oxygen or any equipment through which oxygen passes. Oil or grease may ignite violently in the presence of oxygen under pressure. Therefore, never use greasy gloves or rags when handling oxygen cylinders or in working around them.

Acetylene Cylinders

104. Keep the acetylene cylinder upright, unless it is impossible to do so; in that case, raise the outlet slightly. This will prevent the acetone from running out. Keep the valve protection caps on cylinders.

105. Never use any defective equipment or attempt to repair welding equipment yourself.

106. Make sure that the hose is properly connected. Use a hose clamp not a wire.

107. Put nothing, except a standard cap, on top of an acetylene tank. You may damage the safety plugs.

108. Tanks should not be rolled on the floor.

109. The tip of the torch must not be left inserted in any barrel or tank.

110. Warm water, never boiling water or a flame, must be used to thaw out an outlet valve that has become clogged with ice.

111. Never open the acetylene cylinder near other welding or cutting work, or any possible source of ignition. Always keep the acetylene outlet pointed away from the oxygen cylinder.

112. Flush out a new hose with oxygen gas before using. Never use acetylene gas for this purpose.

113. Always leave the "T" wrench on the tank in order that the cylinder may be shut off quickly in an emergency.

Arc Welding

114. Never, under any circumstances, look directly into the welding arc with the naked eye.

115. Obtain first aid immediately after exposing the eyes to the full glare of the arc at close range.

116. Be sure that your helmets and shields are free from cracks.

117. The colored glass in welder's goggles must always be protected from metal splatter by using a plain glass that is replaced easily and inexpensively.

118. The skin of face, hands and arms must be covered to prevent burns from the rays.

119. Leather gloves must be worn to protect hands from spatter, arc rays and hot objects.

120. For overhead welding, a welder's cape should be worn to protect neck and shoulders.

121. Do not operate the polarity switch while welding.

122. Do not operate the voltage or current regulator while welding.

123. Always pull the main switch and lock out before starting to work on live circuits which are supplying power.

124. Always ground the arc welding set to prevent shock from stray currents.

125. Always leave the electrode holder on an ungrounded piece of material or in a special holder. It should never be placed on a metal table or any other grounded device.

126. All cable connections should be checked to see that they are properly made and are not allowed to work loose. They should never be operated while they are hot.

Field Erection Work and Sketching Which Would Involve the Installation of Safety Guards, Duct Work and Equipment

127. The foot of a ladder should be one-fourth of the ladder's length away from the wall against which the ladder is leaning.

128. Never leave tools on top of a stepladder or on any other elevated place from which they may fall.

129. Ladders should be placed against a solid, stationary backing. Keep metal ladders away from places where electric shock may be encountered.

130. Always face the ladder when ascending or descending. Use both hands.

131. Use only ladders that are in good repair. Never use a broken or a weak ladder or a ladder with missing rungs.

132. Make certain that ladders are safe and secure before attempting to climb them. Tools and material can be hoisted or lowered *after* you have safely climbed or descended.

133. Ladders must not be used unless they are equipped with proper safety shoes or cleats.

134. Men working in elevated locations must place proper warning signs; and, if possible, protect other workmen by roping off dangerous sections. Be certain scaffolding is strong enough to support you and your materials and is securely fastened to structure.

135. Wear safety shoes and a metal helmet to protect your feet and head from falling objects. Do not walk or stand beneath crane loads.

Soldering

136. Soldering coppers should be kept in a definite place and not left lying around. Hot soldering coppers should not be carried around the shop.

137. Students should not leave hot soldering coppers unattended in the shop. Others might get burned.

138. Electric soldering irons should be turned off when not in use.

139. Students should be warned of the danger of burns from soldering flux and acids. Also against eating after working with soldering flux. They should keep their hands away from eyes and mouth when soldering.

140. Breathing fumes while soldering is hazardous.

141. All acids should be stored in a safe manner and in proper containers.

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Safety education data sheets are available from the National Safety Council. *Write for prices. A complete set of bound data sheets entitled, "The Encyclopedia of School Safety," (Stock #429.07) is available for $16.30 less 20% discount for NSC members.*

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Sample No. 27

SAFETY

In the Classroom and Hallway

1) Set up traffic patterns in corridors and stairways. Students should keep to the right.

2) Set up Hall Patrol to enforce no running, no crowding, and no horseplay rules. Doors should be held open during changes of class.

3) Instruct students to carry pencils, books and other objects in a manner that is not hazardous to others.

4) Use care near hallway lockers. Be careful opening and closing locker doors.

5) Keep classroom aisles free of books, lunches, briefcases and feet.

6) Special attention must be given to safety in shop classes.

   (a) Power machinery use must be carefully supervised.
   (b) Proper guards must be used on machinery.
   (c) Loose clothing and neckties should be tucked in.
   (d) Clean up oil, water and scraps on floor.

7) Home economics classes present certain hazards also.

   (a) Use care in lighting gas flames on stoves.
   (b) Pot holders and aprons should be in good condition.
   (c) Handles of pots should not protrude beyond edge of stove.
   (d) Close supervision is necessary when hot liquids or sauces are being handled.
   (e) In sewing classes, close supervision, instruction, and use of guards is necessary when using machines.

8) All students should be reminded that pens and pencils are hazardous. If puncture wounds do occur, the unsafe practice leading to this wound should be discussed and prevented in the future.

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SAFETY

On School Premises

1) Whenever students are on school grounds, a teacher or other capable supervisor must be present.

2) Allow students to establish rules for playground, recess, and other activities on school grounds.

3) Establish a playground patrol to enforce these rules.

4) Inspect playground apparatus, buildings, and grounds frequently.

5) Apparatus should be fenced off or clearly separated from other play areas.

6) Hazard areas for swings should be brightly colored to warn students who might walk into the path of a moving swing.

7) Keep bicycles off playground area. Arrange for suitable racks and parking area for bicycles.

8) Arrange for proper loading and unloading of school buses. Children must be aware of and follow the rules set up for loading and unloading to reduce congestion and crowding.

9) Make sure that traffic patterns of bicycles, pedestrians, school buses, automobiles and delivery trucks are properly integrated and do not conflict.

10) Conduct frequent firedrills. Utilize blocked exits, unannounced times and other surprise conditions to simulate real fire conditions.

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SAFETY

Off School Premises

1) Supervisors of field trips should emphasize the particular safety hazards connected with the activity involved. Means of keeping the group together should also be outlined.

2) Rules and regulations regarding School Bus Safety must be set up and promulgated.

   (a) Loading and unloading must be accomplished in orderly and unhurried manner. Students should leave the unloading area immediately upon debarking at school.

   (b) If feasible, crossing guards should be present at each school bus stop to assist students in both the morning and afternoon.

   (c) Older children should watch out for younger ones.

   (d) Emphasize the importance to students of being on time.

   (e) Keep head, arms, and hands inside the bus.

   (f) Do not dispose of trash out of bus windows or in the bus.

   (g) Do not clutter aisleways with books, packages, or feet.

3) Safe pedestrian practices must be instilled in all students:

   (a) Students should follow the safest and most direct route to and from school, utilizing areas controlled by crossing guards if practical.

   (b) Student safety patrols should be set up with the power to enforce established rules and regulations.

   (c) Instruction should be given in proper crossing of streets, especially to younger children.

   (d) Hitchhiking should be prohibited. Its dangers should be outlined to all students.

   (e) Have students collect statistics on pedestrian accidents and pinpoint these on maps.

4) Students must understand the necessity for orderly conduct at athletic contests. Horseplay and running must not be permitted in grandstands and bleachers at either home or away games.

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SAFETY

In Non-School Connected Activities and the Home

1) A planned program of Driver Education must be set up and followed through.

2) A similar program should be established for Bicycle Safety.
   (a) Require safety inspection of bicycles.
   (b) Test owners of bicycles for knowledge of traffic rules.
   (c) Test owners for riding ability and skill.
   (d) Register bicycles and issue tags.
   (e) Enlist the aid of local service organizations or police force in the above procedures.
   (f) Establish a bicycle court to deal with offenders.

3) Set up assembly program regarding traffic safety (Troop B Headquarters of the N. J. State Police in Morristown will arrange an extremely effective assembly program. For information call 201-JE-8-4330.)

Emphasize safety reminders for Holiday Seasons:
   (a) Ensure that Halloween costume does not restrict mobility and that vision is not obstructed by mask.
   (b) Special attention should be paid to pedestrian safety during dark hours on holiday eves.
   (c) Use of candles during holidays must be carefully supervised.
   (d) Emphasize the extreme fire hazard which Christmas trees present.

5) Have students set up plan for fire drills at home. Have them diagram escape exits from each room of their homes.

6) Emphasize the need for fire extinguishers in the home.

7) Emphasize boating and swimming safety procedures before summer vacation:
   (a) Do not swim or boat alone.
   (b) Swim only in areas supervised by life guards.
   (c) Do not attempt feats beyond abilities.
   (d) Be alert whenever near water (half of all drownings occur to non-swimmers.)

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Sample No. 28

Safety Instructional Techniques for Shop Teacher

1. Develop safety-consciousness in the students through teacher example —— always doing things in the safe way.
2. Develop safety instruction in courses of study for the shop.
3. Teach accident prevention with a positive approach——stressing the correct way to perform an operation.
4. Require all beginning shop students to make a careful study of hazards in the shop during the first few days of the course.
5. Provide detailed instruction as to the procedure to follow in case of a shop accident.
6. Give shop demonstrations stressing safe use of hand tools. Utilize student information sheets in following up the demonstration.
7. Present safety instruction with the following objectives in mind:
   a. The student will develop a sense of responsibility for his/her own safety and the safety of others
   b. The student will know the correct procedure of doing things in the shop.
   c. The student will be aware of hazardous situations.
8. Give periodic demonstrations on the proper use and care of personal protective devices.
9. Provide each student with information sheets dealing with the general safety rules for the shop.
10. Require each student to sign information sheets dealing with shop safety rules and regulations to indicate that s/he has read and understood the regulations. A copy of these sheets should be kept on file, and the student should keep the original with his/her other instructional material.
11. Provide instruction as to correct maintenance of shop tools.
12. Provide a bulletin board for safety bulletins, posters, safety rules and regulations, and appropriate safety materials.
13. Provide instructions in the safe method of lifting and/or moving heavy equipment or other loads.
14. Provide a safety suggestion box for student use.
15. Invite outside speaker to talk about the importance of each student acquiring the proper attitude toward accident prevention. Can relate to OSHA (Occupational Safety and Health Act).
16. Take field trips to industrial plants, construction jobs to study on-site safety practices.

CHAPTER IX

METHODS USED IN ASSESSING STUDENTS' KNOWLEDGE OF SAFETY

A. Written Safety Tests – General

Instruction in safe practices is followed by testing. (Samples 29 through 31 are some of the tests from a single shop. Similar teacher-made tests are used in other shops.) Students are not allowed to use specific pieces of equipment until they have passed the tests and signed the safety cards, including eye-protection cards. (Sample 33) In many shops, progress charts indicate the safety tests passed. (Sample 34) In addition to written tests, students must also pass performance tests. (Sample 32)

Sample No. 29

Final Safety Test
Before Student Can Use Equipment

MIDDLESEX COUNTY VOCATIONAL AND TECHNICAL HIGH SCHOOL

Machine Shop – Safety

Student's Name _____

SAFETY TEST FOR MACHINE SHOP

All students must pass this safety test satisfactorily before they will be allowed to operate power machines or other hazardous equipment. The purpose of this test is to determine the student's knowledge of the safety precautions necessary in the use of machines, tools, equipment and materials.

* * * * *

DIRECTIONS: The following statements are to be made complete by writing the correct word or words on the line to the right. The first statement will serve as an example.

1. Machines or hardening equipment must not be used until permission is obtained from the _*Teacher*_
2. It is dangerous to use a hammer with a loose handle because the hammer head may _____
3. Safety signs are posted in the shop to remind students to be _____
4. When a student is in doubt regarding the safe way to operate a machine, use a tool,or handle material or equipment, he or she should ask the _____
5. Fooling, running through the shop, or horseplay of any kind is _____
6. Oil or grease should be wiped from the floor because of the danger of _____
7. To smother flames, if a student's clothing catches fire, use the _____
8. It is dangerous to use cold chisels or other tools with mushroomed heads because when hammered, chips may _____
9. In case a student receives an injury (no matter how small) he or she must report it at once to the _____
10. When using the cut-off saw, be sure to clamp material securely in place before _____
11. Never use a file without a _____

12. Never stand on a machine to oil the countershaft or repair belt. Use a _____

13. Tools or pieces of metal left on the floor may result in persons' tripping and falling against _____

14. Talking to a student while he is operating a machine may distract his _____

15. Never attempt to throw off a pulley belt by hand; use a _____

16. Never use a cotton waste for cleaning machine beds, as it collects metal chips which may cut the hands. For this purpose, use _____

17. Oily waste or rags left lying on machines or benches may cause _____

18. Never operate a machine when the proper guards are not in _____

19. When operating the drill press, do not hold work with the hands; use _____

20. Hardening furnaces must not be used by a student until he/she has received the necessary _____

* * * * * *

THIS IS TO CERTIFY that I have received instruction on safety precautions in the _____ shop.

The instructor has demonstrated to me how to operate each machine correctly and safely. I promise to observe all safety precautions, and if ever in doubt regarding any operation, I will get the necessary information from my instructor.

Signed _____
Student

Date _____ 19__

THIS IS TO CERTIFY that _____ has been given safety instructions and safety demonstrations on the use of machines and tools in this shop and has satisfactorily passed this written test.

Signed _____
Teacher

Date _____ 19__

Machine Shop Test

MIDDLESEX COUNTY VOCATIONAL & TECHNICAL HIGH SCHOOL
MACHINE SHOP – SAFETY

DIRECTIONS: Read the question in the left-hand column, then find the statement in the right-hand column that best answers the question. Put the number of the question in the space between the parentheses in front of the best answer. Example: Read question #1, and then look in the right-hand column. The figure "1" has been placed in front of the best answer.

MATCHING TEST SECTION 1

1. Why is fooling, runnning, or any kind of "horseplay" dangerous in the machine shop?	( )A fire blanket is hung in a convenient place in the shop and is to be used to wrap around a person whose clothing has caught fire. Pull the blanket out from the container and wrap around the person to smother flames.
2. Why is it dangerous to wear loose neckties or sleeves when operating power machinery?	( )A belt stick must be used to throw off belts from pulleys. Failure to use a belt stick may result in metal hooks of belts tearing fingers, or the hand getting caught between belt and pulley.
3. What is the purpose of the fire blanket?	( )Oily waste and rags are very inflammable. If allowed to lie around loose or to accumulate, fire may result through spontaneous combustion.
4. Why is it dangerous to leave tools or pieces of steel lying around on the floor?	( )An inexperienced student may cause damage to the machine and a serious accident to himself or others.
5. Why is it dangerous to distract a student's attention while s/he is operating a machine?	( )Regular shoes should be worn by students in the machine shop. Sneakers are no protection against slippery or oily floors, falling objects, or the edges of metal.

6. What may be the result if oily wastes or rags are left lying around the shop?	( )Because of the danger of the head's flying off and striking someone.
7. Why is it dangerous to attempt to throw off a pulley belt by hand?	(1)Students while fooling may run or fall against vises, projecting parts of machines, or other students who are operating machines, causing injury to themselves or others. Fooling with the air hose by turning it on or in the direction of another student is extremely dangerous.
8. Why should a student *not* use a machine until s/he has had the necessary safety instruction and has received the permission of the teacher?	( )Unnecessary talking, fooling of any kind, or "ganging up" around a machine may distract the operator's attention from the work, thereby causing an accident.
9. Why is the wearing of sneakers a hazard in the machine shop?	( )A loose tie or sleeves may become entangled in revolving machinery, with resulting injury to the worker.
10. Why is it dangerous to use a hammer with a loose head?	( )Tools or metal must not be left on the floor. Neglect of this precaution may result in persons' tripping or falling against the machines or benches.

MATCHING TEST SECTION 2

1. Why is it dangerous to use a cold chisel or punch with a mushroomed head?	( )Oil or grease allowed to remain on the floor may result in slipping, with resulting injury to the student or other person.
2. Why is the use of goggles necessary for safety?	( )Never overlift. When required to move or lift heavy metal or pieces of machine equipment, obtain assistance.
3. What is the safety rule in regard to chipping metal?	( )Failure to use goggles may result in injury to the eyes from flying particles of emery dust or from wheel breakage.
4. Why is it dangerous to use the fingers to pull metal chips from the lathe?	( )Fooling or carelessness may result in student's touching an exposed part of the switch or connections. Electrical shock or burns may result.

5. What is the safety rule when lifting heavy metal or equipment? ( ) Chips may break off the heads of tools and may cut the hand or hit another person.

6. Why is care important in operating electrical switches? ( ) There are many hazards that are not apparent to the inexperienced student. Carelessness or ignorance may cause an explosion. Cyanide is a poison and must be handled carefully. Hardening furnaces must not be used by a student until s/he has received instruction in their uses and has the permission of the teacher.

7. What is the safety rule in regard to guards on machines? ( ) Never move a step ladder until all tools have been removed from its upper step or platform. Neglect of this precaution may result in tools' falling and injuring worker or other person.

8. What may happen if oil or grease is allowed to remain on the shop floor? ( ) Always wear safety goggles. Always chip toward the wall or away from other workers.

9. What are the safety precautions in the use of stepladders? ( ) Chips from the lathe are hot and sharp and may result in deep cuts on the fingers if handled carelessly.

10. Why is care necessary in the use of hardening furnaces? ( ) Never operate machines when guards are not in place. Attention to this precaution will prevent accidents from revolving gears, pulleys, belts, etc.

Sample No. 31

Machine Shop Safety Test
Given to Each Student

GENERAL SAFETY PRACTICES

DATE_____ PERIOD_____ NAME_____

_____ 1. Any dangerous condition in the shop must be reported to the teacher
(a) when convenient (c) at the close of class
(b) at once (d) after school

_____ 2. When you enter another shop you shall report to the teacher
(a) after you complete your work (c) immediately
(b) if teacher asks you for a pass (d) before getting to work

_____ 3. Guards and other safety devices are for your protection. Always
(a) remove them (c) keep them in place
(b) cover them (d) move them out of the way

_____ 4. Oily rags and waste must be put in
(a) a wood box (c) a wastebasket
(b) a closed metal container (d) covered cardboard box

_____ 5. Spilled oil or grease is dangerous. Always
(a) clean it up (c) pour water on it
(b) leave it (d) sprinkle gasoline on it

_____ 6. Gasoline, paints, kerosene and other materials that will burn are never to be used near
(a) another student (c) a workbench
(b) an open flame (d) a wooden building

_____ 7. Disturbing another student while he is working is
(a) helpful (c) dangerous
(b) poor manners (d) the quickest way to do a job

_____ 8. Caution another student if you see a violation of
(a) good manners (c) safety practices
(b) proper grammar (d) proper posture

_____ 9. Do not carry sharp or pointed tools or material in your clothing. Hold sharp points or edges
(a) down (c) up
(b) out (d) in the hand

10. When working with power tools, all loose clothing and loose jewelry must be

_____
(a) left on
(b) hidden
(c) removed
(d) adjusted

_____ 11. In case of injury, report at once to the
(a) nurse
(b) teacher
(c) class
(d) doctor

_____ 12. If equipment does not work properly, shut off the machine and inform your
(a) neighbor
(b) teacher
(c) custodian
(d) principal

_____ 13. Damage to the shop equipment and tools must be reported to the teacher
(a) next day
(b) next period
(c) at once
(d) never

_____ 14. Lifting heavy objects can cause injury to the student. If too heavy,
(a) ask for help
(b) lift anyway
(c) call the custodian
(d) call the nurse

_____ 15. Before the student operates a machine, he/she must first receive
(a) material
(b) a passing grade
(c) instructions and permission
(d) instructions

_____ 16. All floors, aisles and passageways must be clear of
(a) teachers and students
(b) stock, tools and material
(c) tools only
(d) materials only

_____ 17. Fires involving electrical equipment should be extinguished with
(a) soda/acid
(b) water
(c) carbon dioxide
(d) sand

_____ 18. When extinguishing a gasoline fire, the best type of extinguisher to use is
(a) soda/acid
(b) water
(c) CO_2
(d) blanket

_____ 19. To protect your feet while in the shop you must wear
(a) gym shoes
(b) sandals
(c) oxford type
(d) thongs

_____ 20. When using power machinery your sleeves must be
(a) buttoned down
(b) rolled up one turn
(c) rolled above elbow
(d) rolled as high as possible

_____ 21. So that hair (collar length or longer) does not become entangled in machinery, one must either wear a hair net or

(a) take the chance that it won't get caught
(b) secure it behind the head with a rubber band
(c) tuck it inside the collar
(d) push it back before you use the machine

22. Whenever possible the motion involved in striking objects or cutting materials should be done _____ from other students.

23. The proper manner in which to move about in a shop is to _____.

24. Cleanup is the responsibility of _____ students.

25. When using machines or hand tools, give the job at hand all your _____.

26. Whenever in doubt about any job or operation, you must ask the _____.

27. Machinery may be operated only by students who passed their safety test and receive permission from the _____.

28. Nails, tacks and other non-digestible materials are not to be _____ in your mouth.

29. "Horse play" is _____ permitted in any shop.

30. The habits of care and caution which students develop through safe practices protects _____ and others.

31. In order to extinguish a fire quickly, it is important that you know the _____ of all fire extinguishers in the shop.

32. Spilled liquids such as gasoline, kerosene or oil are a fire hazard and must always be _____.

33. Before touching electrical switches, plugs or receptacles, hands must be completely _____.

34. Eye glasses must never be substituted for face shields or _____.

35. A stream of compressed air must never come in contact with your _____.

36. The emergency power switch must be shut off only in an _____.

37. Only the teacher and the operator are permitted within the working area around a machine. Other _____ are to stay outside that area.

38. Never use a file that does not have a _____ on it.

39. Always use the correct _____ for the job.

40. Before using electrical devices check the condition of the cord and _____.

(B.) Teacher-Made Performance Test

This test is designed to measure the student's manipulative skill in the safe operation of a table saw. The performance objectives describe the expected behavior.

During the testing some errors may occur such as: selecting a piece of wood with knots, or forgetting to lower the blade after completing the operation. Since performance objectives are to be used as standards of minimum qualification, it is necessary to establish levels of acceptable performance.

The first step is to list all the individual tasks that will be used to successfully perform a particular operation. List all the possible tasks, whether relevant or irrelevant, as the latter can be eliminated in the second step.

The second step is to list the steps that are involved in *actually* performing the operation safely, making sure that unimportant tasks are not included in the list of performance objectives. For example, in operation 4 of the Safety Performance Test, the student will not be required to actually measure the ¼" blade clearance above the wood stock, but will be required to visually determine ¼" clearance. One problem that may occur is forgetting to include in the task performance an operation that is very easy but is absolutely essential. For example, a student's failing to check a blade before he/she uses the machine.

The test to be used in evaluating the students' competency contains the following five major headings:

Operation –

These operations should be performed in sequential order, as each step relies very heavily on the preceding step, although leeway is possible for some steps.

Performance Task –

These tasks are both recall and manipulative performances. The student must know what is to be done and must do it.

Frequency of Performance –

This heading states how often the performance task is to be done: "Every occasion, Frequently, Once in a while."

Level of Importance –

This heading indicates the relative importance of the task in respect to the operations. Each operation and task should be labeled 1, 2, or 3 to indicate the evaluator's judgment of importance, number one having the greatest importance.

Performance Rating –

This heading indictes the student's performance as to knowledge of the machine, recall of facts, and operation of the machine. The rating scores are as follows:

E – Excellent	(3)
G – Good	(2)
F – Fair	(1)
P – Poor (Failure)	(0)

SAFETY PERFORMANCE TASK TEST – OPERATION OF A TABLE SAW

Instructor: *Mr. Amato*

Student: _____ Date _____ Score _____

Operation	Performance Task	Frequency of Performance	Level of Importance	Performance Rating
1	Select stock that is surfaced on one side.	Every occasion	1	E G F P
2	Inspect glade for sharpness and correct blade.	Every occasion	1	E G F P
3	Adjust blade guard and splitter before use.	Every occasion	1	E G F P
4	Set blade ¼" above stock to be cut before use.	Every occasion	1	E G F P
5	Stand to one side of the operating blade.	Every occasion	1	E G F P
6	Do not reach across blade to hold or grasp stock.	Every occasion	2	E G F P
7	Maintain a 3" to 4" clearance from the blade.	Every occasion	1	E G F P
8	Use the fence or miter gage – never freehand.	Every occasion	1	E G F P
9	Stop the machine when making adjustment to the fence or blade.	Every occasion	2	E G F P
10	Use a push stick for small-width cuts or for clearing wood scraps from blade area.	Every occasion	1	E G F P
11	When ripping a warped board, place the cup face down.	Every occasion	1	E G
12	Remove dado or other special blade immediately after use.	Every occasion	1	E G F P
13	Control the feed of a long length of stock and request help for support only.	Every occasion	2	E G F P
14	Turn off machine and lower blade immediately after use.	Every occasion	1	E G F P

C. Safety Cards

In addition to the requirement that students be checked out on each machine or piece of equipment, they are required to fill out and sign eye-safety and other safety program cards, which should be kept on file by the shop teacher. (Samples below)

Middlesex County Vocational and Technical High School

SAFETY PROGRAM

I_____have received instruction in Safety in the_____ pertaining to the use of tools and equipment. I was also instructed on safe practices while in the school building and this department.

_____ Date

_____ Sign Here

Middlesex County Vocational and Technical High School

EYE SAFETY PROGRAM

I_____have received instruction in the proper care and use of eye protective devices.

_____ Date

_____ Sign Here

D. Safety Progress Charts

Safety Progress Charts shall be prominently displayed indicating the specific tools and equipment on which each student has been instructed and has satisfactorily passed the performance test. (Sample No. 34)

EQUIPMENT SAFETY PROGRESS CHART

			SLICING MACHINE	D.W. MACHINE	P.W. MACHINE	VERTICAL FOOD CUTTER	TABLE FOOD CHOPPER	ELEC. OVEN/STOVE	GAS OVEN/STOVE	BROILER (ELEC.)	BROILER (GAS)	ELEC. FRYER	PRESSURE COOKER	STEAM KETTLE	BAKING OVEN	LAUNDRY MACHINE	POTATO PEELER	ELECTRIC GRILL
AM	CANDY LIPPINCOTT	1																
	VEN WHITE	2																
	LISA ZUNDEL	3																
	KATHLEEN MULLEN	4																
	JANICE MARTIN	5	1/W	1/W	1/W	1/10	1/10	1/9	1/10	1/10	1/10	1/10						
PM	HAROLD BARLETT	6	1/W	1/11	1/10	1/6	1/9	1/5	1/3	1/W	1/4	1/W	3/2	3/2	3/2	3/2	3/2	3/2
	BRENDA COX	7	1/W	1/W	1/W	1/11	1/11	1/11	1/10	1/10	1/10	1/10						
	JOE CAMPBELL	8																
	LINDA HAVRILLA	9	1/W	1/W	1/W	1/11	1/11	1/11	1/11	1/W	1/W	1/W						
	JAMIE ROHR	10	1/3	1/4	1/4	1/5	1/6	1/9	1/9	1/9	1/11	1/W						
	ARTHUR SMITH	11	1/3	1/4	1/5	1/6	1/9	1/9	1/10	1/W	1/11	1/11		3/2	3/2			
	MIKE YUNIVER	12	1/W	1/11	1/10	1/W	1/W	1/5	1/4	1/3	1/3	1/4	3/2	3/2	3/2	3/2	3/2	3/2
	PAT ZUNDEL	13	1/W	1/W	1/3	1/4	1/5	1/6	1/9	1/10	1/W	1/11		3/2	3/2			
	MIKE HINE	14	1/W	1/11	1/10	1/9	1/6	1/5	1/4	1/3	1/W	1/W				1/W		
	DANNY GALLODO	15	1/W	1/W	1/W	1/11	1/11	1/11	1/10	1/10	1/10	1/W				1/W		
	FRANK ANTONETTI	16	1/W	1/W	1/W	1/11	1/W	1/11	1/11	1/11	1/11	1/11	2/3	2/3	2/3	1/W	3/W	
		17																
		18																
		19																
		20																

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Sample No. 34

CHAPTER X

BUDGETING FOR SAFETY

This budget covers only basic costs incidental to the implementation of a **Safety Program per se.** It does not include the cost of supplies and equipment that are normally a part of the instructional program.

Where changes in rules and regulations require major architectural corrections, or where such corrections are recommended by the insurance carrier, special budgeting may be required.

Membership in the National Safety Council and the purchase of posters, data sheets, AV materials etc., shall be the responsibility of the individual principals.

Each school shall maintain its own library of audio-visual materials on Safety, and such materials shall be purchased on the recommendation of the Safety Advisor and principal. At least fifty cents per student shall be allocated for this purpose.

SAFETY BUDGET – 1979-80

Basic per student allocation	
3000 students @ .50 each	$1500
Half-day annual safety workshop	
Participant materials: 300 teachers @ $2.00 per teacher	600
Development of New Material at Curriculum Laboratory & workshop	
One teacher, one month's salary	1500
Paper, ink, etc. for annual freshman Safety Booklet Project and other special pamphlets to be printed in school print shop	500
Miscellaneous expenses for Safety Director (Conferences, books, special AV materials)	250
	$4350

CHAPTER XI

RESOURCE MATERIALS

A. Books:

Accident Prevention Can Be Learned
Metropolitan Life Insurance Company

Accident Prevention Manual for Industrial Occupations
National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Accident Prevention Manual for Shop Teachers
William A. Williams
American Technical Society, Chicago, 1963

An Accident Prevention Program for School Shops and Laboratories
U.S. Department of Health, Education and Welfare, Office of Education

Construction Industry Safety and Health Regulations, Part 1926
United States Department of Labor
Occupational Safety and Health Administration

General Industry Safety and Health Regulations, Part 1910
United States Department of Labor
Occupational Safety and Health Administration

The National Electrical Code, Low Voltage

The New Jersey Fire Marshall Regulations or Administrative Codes Pertaining to Fire Prevention

OSHA Comprehensive Safety Compliance Program
National Organization for Public Education Employee Relations Specialists, Encino, CA.,1975

Safety Education
American Technical Society
848 East 58th Street
Chicago, Illinois 60637

Safety In Industry – The Fundamentals of Accident Prevention
U.S. Department of Labor
Occupational Safety and Health Administration
Washington, D.C.20210
Bulletin #247

Safety in Trade & Industrial and Technical Education
Curriculum Development Center, Vocational Education, University of Kentucky, Lexington, KY, 1974

Shop Safety
Westinghouse Learning Corporation
100 Park Avenue
New York, New York 10017

B. Catalogs

The following student materials are made available through the American Medical Association, 535 Dearborn Street, Chicago, Illinois.

Electrical Safety
Electrical Safety/ Catalog #1771-1015

Fire & Explosion
Fire/ Catalog #1771-1002

Hand Safety
Hand Safety/ Catalog #1771-1036

Material Handling & Storage
Moving Things Safely/ Catalog #1035

Psychology of Safety
Courtesy/ Catalog #1771-1806

C. Documents – ERIC

Find Your Way – ERIC Document No. VT 011 550, N.J. Occupational Resource Center, Edison, N.J.
46 pages. This learning activity is intended to help the new student become familiar with the placement, purposes, uses, and safety rules of power equipment in the shop.

Safety Handbook: A Guide for Industrial Arts Programs and Transparency Masters – Document No. VT 009 867

Safety in the Auto Shop – Document No. VT 011 497
Unit 1 – lap. No. 1, Edgar Williams, *et al.* ND. 18 pages. A learning-activity package on safety in the high school auto shop. A self-instructional unit.

Safety, Your Concern and Mine – Document No. VT 011 495
Learning Activity Package, Safety in the Wood Shop. LAP No. 2 by R.M. Shreve. July 1968. 20 pages. Describes safety rules for the high school wood shop. Covers also general safety rules.

Service Station Safety For Young Workers – Document No. VT 010 333
1965. 28 pages. Summarizes safe work habits for service station employees when lubricating a car, changing a tire, or checking the radiator.

Shop Safety – Document No. VT 010 686
1966. 38 pages. Workbook for student use in learning shop safety rules. Explanatory text and line drawings followed by questions which student must answer and check.

Use of Color For Safety – Document No. VT 011 626
Safety in Industry Instructor Outline. Bulletin 298. Includes teaching aids and tips.

Fundamentals of Accident Prevention – Document No. VT 011 343
Safety in Industry Organization and Administration Series. Outlines the basic elements which must be incorporated into every program of accident prevention if maximum results are to be obtained.

Illumination for Safety – Document No. VT 011 625
Safety in Industry Instructor Outline. Bulletin 297. Includes teaching aids and tips.

Preventive Maintenance for Safety – Document No. VT 011 621
Safety in Industry Instructor Outline. Bulletin 290. Includes teaching tips, charts, and teaching aids.

Safe Working Surfaces – Document No. VT 011 623
Safety in Industry Instructor Outline. Bulletin 292. Includes teaching tips and aids.

Recommended Safe Practices for Gas-Shielded Arc Welding – Document No. VT 011 980
1966. 16 pages. Discusses the potential hazards associated with the gas shielded arc welding process and gives recommended control measures.

Rigging and Safety for Apprentice Training in the Plumbing and Pipe Fitting Industry – Document No. VT 010 015
D. Bart Phipps, August, 1955. 48 pages. Contains instructional material on rigging and safety – part of apprenticeship training for plumbing and pipe fitting industry.

D. Free-Loan Films

New Jersey Department of Labor & Industry
Bureau of Engineering & Safety
Catalog lists over 100 free Safety Films
1100 Raymond Boulevard, Room 419,
Newark, N.J. 07102

Liberty Mutual Insurance Co. Films

Building Construction:
"If You Took Your Family To Work"
"Watch the Wires"

Fire and Explosion:
"Flammable Liquid – Fire Safety"
"Know Your Fire Hazards"
"Portable Extinguishers"

Machine Operations and Guarding:
"It Didn't Have to Happen"
"It's in the Cards"

Material Handling & Storage:
"Facts About the Back"
"How to Avoid Muscle Strains"
"Safety Makes Sense"

Personal Protective Equipment:
"Be a Pro"
"Don't Push Your Luck"
"To Live in Darkness"

Psychology of Safety:
"Everything to Lose"
"Growing Pains"
"Knowing's Not Enough"
"Safe As You Think"
"The Trap"

Road Construction:
"The Gamblers"
"It Could Happen To You"
"Matter of Time"

Tool Safety – Hand & Powered:
"For Safety's Sake"
"Grinding Wheel Safety" (Norton)

U.S. Steel Corporation Films

Hand Safety:
"The Handtrap Test"
"With These Hands"

U. S. Steel Corporation Films: (cont.)

Safety Equipment:
"Hard Hats and Thinking Caps"

Safety Practices:
"Knowing Is Not Enough"

E. Filmstrips:

"Electrical Safety"
AIRCO Welding Products, Inc.
Stanley-Bowmar

"First Aid"
First Aid Series
Nine Filmstrips
McGraw-Hill, Text-Film Division

"Safety Practices"
Scott Education Division

"Tool Safety – Hand & Powered"
AIRCO Welding Products Inc.

"Safety at School"
Eye Gate Quickstrips
Eye Gate House
146-01
Archer Avenue/ Jamaica, New York 11435

F. Publications from NIOSH:

The following are publications from the National Institute for Occupational Safety and Health (NIOSH), Office of Public Information, Room 10-A022, 5600 Fishers Lane, Rockville, Maryland 20852:

Kit of Basic NIOSH Reference Materials

Basic materials concerning the Occupational Safety and Health Act of 1970 and the NIOSH program. Contains article reprints, fact sheets, and related materials.

Films and Filmstrips on Occupational Safety and Health

Listing of occupational safety and health films and filmstrips compiled to provide interested individuals and groups with a current reference to loan-free audio-visual aids. Includes a listing of organizations that offer rental and purchase occupational safety and health audio-visual aids.

Working With Industrial Solvents

8 pages. For use by workers using organic industrial solvents. Pamphlet includes a discussion of the nature of solvents, health problems, control of exposure, and the actions of employers and employees.

Welding Safely

8 pages. Information pamphlet for welders. Discusses the health aspect of welding operations. Pamphlet includes a discussion of health hazards, control methods, and possible actions by management and workers.

Job Safety and Health Services

4 pages. Discusses the services NIOSH can offer to private industry and other government agencies and where these services can be obtained.

Working With Cutting Fluids

5 pages. Discusses what cutting fluids are, how they are used, how they may affect the worker, and methods for control.

Directory of Governmental Occupational Safety and Health Personnel

Annual listing of local, state and Federal agencies engaged full or part-time in occupational safety and health activities.

A Learning Experience in Occupational Safety and Health

12 pages. Course listing for NIOSH's Division of Training for June 1973 – July 1974.

G. **Films:** (Some of these are available for rental, others may be free. Check with distributor.)

Travelers Insurance Companies
Travelers Film Library
52 Prospect Street, Hartford, Connecticut 06115
"The Challenge"

Union Pacific Railroad
Motion Picture Bureau
"Days of Our Years"

Aetna Life and Casualty Co.
Public Relations and Advertising Dept. Film Library
151 Farmington Avenue
Hartford, Connecticut
"Don't Drop Your Guard"

Travelers Insurance Companies:

"Home Sweet Home"
"Knowing Not Enough"

Aetna Life and Casualty Company

"Lifting, Man's Age Old Problem"
"Safety at Work"

Clark Equipment Company
Industrial Truck Division
Battle Creek, Michigan 49016
"Safety Makes Sense"

Bell Systems Telephone Office
"Slips and Falls"

Aims Instructional Media Service, Inc.
P.O. Box 1010
Hollywood, California 90028
"Safety . . . a Major Emphasis in Each Instructional Module"

Coronet Films

Coronet Instructional Materials
65 East South Water Street
Chicago, Illinois 60601
"Safety Practices in the Shop"

Journal Films, Inc.
909 West Diversey Parkway
Chicago, Illinois 60614
"We'll See Tomorrow"

NBC Educational Enterprises, Inc.
30 Rockefeller Plaza Room 1040
New York, New York 10020
"Safety"

Modern Talking Picture Service
Caterpillar Film Library
1687 Elmhurst Road
Elkgrove Village, Illinois 60007

"Best Foot Forward" – motion picture, sound, color, 15 minutes

Entertains workers while emphasizing foot protection and the quality of today's shoes.

Modern Talking Picture Service, Inc.

"Challenge of Safety " – motion picture, sound, color, 23 minutes. Depicts safe operation of construction equipment.

Southern California Edison Company
P. O. Box 800
Rosemead, California 91770

"Climbing with Confidence" – motion picture, sound, color, 28 minutes, 1969

Film discusses the proper form for climbing poles and the care and maintenance of climbing equipment.

National Society for the Prevention of Blindness
79 Madison Avenue
New York, New York 10016

"Don't Push Your Luck" – motion picture, sound, color, 13 minutes, 1968

Vividly depicts a blinding eye accident in an industrial plant. A dramatic tool for boosting plant safety programs.

Modern Talking Picture Service Inc.

"Everything to Lose" – motion picture, sound, 21 minutes

Shows the terrible consequences of ignoring shop safety rules . . . of taking foolish chances where there's everything to lose.

Film Distribution Service
Bausch and Lomb
635 St. Paul Street
Rochester, New York 14602

"Expedite School Eye Safety" – motion picture, sound, color, 12 minutes

Eye hazards in school and college chemistry labs, industrial art classes, and industrial shops – with the specific eye-safety equipment recommended.

Creative Communications, Inc.
13900 Panay Way, M–120
Marina del Rey, CA 90291 (loan-free only to qualified organizations)

"Gift of Life" – motion picture, sound, color, 18 minutes

By juxtaposing the rewards life offers when one is sound of mind and limb with the tragedies of accidents and death, the camera gives new meaning to safety practices. This film portrays a wide range of accidents and all of those which happen most frequently to carpenters while they're on the job.

U.S. Steel Film Distribution Centers

"The Handtrap Test" – motion picture, color, 20 minutes

Test on hand and finger injuries and related pinchpoints. Helps create and maintain awareness of potential hazards faced daily.

"The Hard Hats and Thinking Caps" – motion picture, color, 29 minutes

Film was designed to reduce accident among the structural ironworkers in American Bridge Division by establishing a constant awareness that thoughtlessness causes most accidents and that the "hard hat" must give way to the "thinking cap" as the emblem of future safety accomplishments.

National Society for the Prevention of Blindness

"It's Up to You" – motion picture, sound, color, 11½ minutes, 1961

Forceful industrial eye-safety message; includes eye-surgery sequence. Industrial, other adult audiences.

Aetna Life and Casualty

"Lifting, Man's Age Old Problem" – motion picture, sound, color, 12 minutes

Special photographic techniques highlight safe lifting guidelines and other tips for avoiding the back problems that plague millions.

Sellstrom Manufacturing Company
Sellstrom Industrial Park
Palatine, IL 60067

"No Second Chance" – motion picture, sound, color, 23 minutes

Makes students and employees realize the importance of eye protection in shop and lab classes. An employee blinded in an industrial accident tells what it's really like to go through life without sight.

Motion Pictures
Bureau of Mines
4800 Forbes Avenue
Pittsburgh, PA 15213

"Oh! My Aching Back" – motion picture, sound, color, 21 minutes 1965

Modern Talking Picture Service, Inc.

"Playing It Safe with Power Tools" – motion picture, sound, color, 14 minutes

Demonstrates safe procedures in the use of variety of portable power tools for industry, home, and lawn and garden. Proper tool application, work preparation, and the use of auxiliary safety equipment are depicted. Film stresses accident prevention by "working defensively."

American Optical Corporation
Safety Products Division
Southbridge, Massachusetts 01550

"The Sound of Sound" – motion picture, sound, color, 16 minutes, 1970

Film focuses on industrial noise; its insidious attack on hearing; the permanence of a noise-related hearing loss. Industrial workers speak candidly of their occupational deafness – their loneliness and frustration. These men avidly support the film's basic message, "Keep the hearing you've got. Wear the proper hearing protection."

Bausch & Lomb
Film Distribution Service
635 St. Paul Street
Rochester, New York 14602

"Straight Talk on Eye Safety" – motion picture, sound, color, 12 minutes

Prevention is the key word in this filmed interview. STRAIGHT TALK ON EYE SAFETY sends a plea to schools and industries on the need for eye and face protection.

External Information Department
IBM Corporation
Neighborhood Road
Kingston, New York 12401

"Survival is the First Job" – motion picture, sound, color, 14½ minutes.

Teaches employee awareness of unsafe situations on and off the job.

Occupational Safety and Health Administration
Department of Labor
Regional and Area Offices

"This is OSHA" – slide animation motion picture, sound, color, 27 minutes, 1973

Broad overview of OSHA activities – its standards setting, compliance inspection, voluntary compliance, training, and State programs.

Modern Talking Picture Service, Inc.

"To Conserve and Protect" – motion picture, sound, color, 14½ minutes

As narrator, James Mason says: "Noise pollution, if allowed to go unchecked, will rob millions of us of our God-given gift – the ability to hear." This important film covers the different aspects of noise pollution – its causes, bad effects on human beings, and what can and must be done to conserve and protect our precious ability to hear.

Mine Safety Appliances Company
201 North Braddock Avenue
Pittsburgh, Pennsylvania 15208

"Way to Live" – motion picture, sound, color, 19 minutes

Explains how a respirator works and how simple it is to wear and take care of. Stresses the importance of wearing proper protective equipment.

Sellstrom Mfg. Company
Sellstrom Industrial Park
P.O. Box 355
Pallatine, Illinois 60067

"Windows of Your Soul" – motion picture, sound, color, 28 minutes

Features the late Senator Everett M. Dirksen in which he points up the importance of wearing face and eye protection in school shops, labs, and industry.

Matheson Gas Products
Box 85
East Rutherford, New Jersey 07073

"Working With Compressed Gases" – motion picture, sound, color, 20 minutes

Its theme – compressed gases – vital, versatile tools for industry and research. How do we handle them safely and productively?

H. **Miscellaneous Teaching Aids:**

"Accident Prevention"
Cassettes Unlimited
Roanoke, Texas 76262 — Cassettes

Safety Charts (10)
U. S. Govt. Printing Office — Charts

School Shop Poster Facket
25 Posters Concerning School Shop Hazards
8½ x 11 inches Stock #189.10
Cost: 1–$2.50; 2–$1.95; 10–$1.65
National Safety Council — Charts

Eye Safety Equipment
Fendall Company
2222 W. Diversey Parkway
Chicago, Illinois 60647 — Charts

National Safety Council
Catalog-Poster Directory
425 N. Michigan Avenue
Chicago, Illinois 60611 — Posters

"Shop Safety"
Westinghouse Learning Corporation
100 Park Avenue
New York, New York
#31-1007 — Self-Instructional Course

"Think First Aid"
National Safety Council — Slides

"Safety Machine & Power Tools"
DCA Educational Products
Industrial Education Catalog
Warrington, Pennsylvania — Transparencies

Deletions are indicated in brackets; new material is underscored.

(Appendix A)

NEW JERSEY ADMINISTRATIVE CODE
EDUCATION
TITLE 6

Subtitle H.	Division of Vocational Education
Chapter 43.	Program Services
Subchapter 1.	Vocational and Technical Education
Section 6:43-1.2	Program requirements

(e) It shall be the duty of every board of education maintaining courses in any field of vocational education to provide all equipment, mechanical and electrical, now in service or which may hereafter be placed in service in such courses, with guards or other protective devices which shall meet the [standards specified in the Labor Laws of the State and the Safety Code of the State Department of Labor] safety standards specified in N.J.A.C. 6:53-1 et seq.

NEW JERSEY ADMINISTRATIVE CODE

TITLE 6

EDUCATION

CHAPTER 53

VOCATIONAL EDUCATION SAFETY STANDARDS

ADOPTED BY THE STATE BOARD OF EDUCATION ON
AUGUST 3, 1977*

*NOTE: These new rules, and the revisions to NJAC 6:43-1.2(e), were filed with the Division of Administrative Procedure, Department of State, on August 3, 1977 (effective on the same date and timetable specified in rules.)

NEW JERSEY ADMINISTRATIVE CODE

EDUCATION

Title 6

Subtitle H. Division of Vocational Education

Chapter 53. Vocational Education Safety Standards

Authority: N.J.S.A. 18A:33-1 et seq., 18A:40-12.2 and 18A:54-1 et seq.

FOREWORD

The following rules and regulations prescribed and approved by the State Board of Education pursuant to N.J.S.A. 18A:33-1 et seq., 18A:40-12.2 and 18A:54-1 et seq. provide safety standards to govern the use of tools, machines, equipment and protective devices in vocational education programs and courses.

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SUBCHAPTER 1. DEFINITIONS

6:53-1.1 Definitions

The following words and terms, when used in this Chapter, shall have the following meanings, unless the context clearly indicates otherwise.

"ANSI" means the American National Standards Institute, 1430 Broadway, New York, New York 10018.

"Approved" means devices having been accepted for a specific purpose by a nationally recognized testing laboratory or agency.

"Closed container" means a vessel sealed by a lid or similar device which will not allow the contents to escape in any form at ordinary temperatures.

"Combustible liquid" means any liquid having a flash point at or above 100° Fahrenheit (37.8°C).

"Flammable liquid" means any liquid having a flash point below 100° Fahrenheit (37.8°C).

"Flash point" of a liquid means the temperature at which it gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid.

"Fuel gas" means acetylene, hydrogen, LP-gas and acetylenic compounds.

"Nationally recognized testing laboratory" means a laboratory such as, but not limited to, the Underwriters Laboratory, Incorporated, United States Bureau of Mines, Factory Mutual Laboratories, or the American Gas Association Laboratories.

"NFPA" means the National Fire Protection Association, 470 Atlantic Avenue, Boston, Massachusetts 02210.

"p.s.i. (p.s.i.g.)" means pounds per square inch (gauge).

"Safety can" means an approved container of not more than five gallons capacity having a spring loaded lid, spout cover and flash arrestor and so designed that it will safely relieve internal pressure when subjected to fire exposure.

"USDOT" means the United States Department of Transportation, The Interstate Commerce Commission, Washington, District of Columbia 20433.

"Vocational education course or program" means any course or program in any public school under the regulatory authority and jurisdiction of the Division of Vocational Education, New Jersey State Department of Education.

"Welder or welding operator" means any operator of electric or gas welding and cutting equipment as part of a vocational education course or program.

SUBCHAPTER 2. STANDARDS IMPLEMENTATION

6:53-2.1 Applicability and implementation of safety standards

(a) All tools, machines, equipment and personal protective devices ordered and acquired for use in vocational education programs after the effective date of the standards shall meet the safety standards contained in this Chapter.

(b) All other tools, machines, equipment and personal protective devices shall be brought into compliance with the standards by September 1, 1978, unless otherwise specified. Tools, machines, equipment and personal protective devices not brought into compliance within the specified time shall be removed from service.

(c) Any school district that, for just cause, can not meet the timetable for compliance may make written request for additional time for compliance. The request, directed to the Assistant Commissioner of Education, State Director of Vocational Education, shall specify the reason(s) for non-compliance and provide a projected timetable for compliance. The Assistant Commissioner of Education, State Director of Vocational Education, or his representative, may grant a reasonable time extension to bring tools, machines, equipment and personal protective devices into compliance with the standards.

6:53-2.2 Safety program

All boards of education operating courses and/or programs in vocational education shall organize, adopt and implement a vocational education safety education program. A copy of the safety education program, indicating local board of education approval, shall be submitted to the Assistant Commissioner of Education, State Director of Vocational Education, within one year of adoption of this section. The safety education program shall contain, as a minimum, the following sections:

(a) Objectives of the safety education program;

(b) A statement of the general policies for the safe operation of vocational courses;

(c) Specific statements of practices and precautions required for safe operation within each separate course;

(d) A plan for periodic inspections and maintenance of facilities, tools, machines, equipment and personal protective devices;

(e) A plan for the identification and elimination of potential hazards;

(f) Emergency procedures to be followed in the event of an accident involving a student, teacher or any other individual;

(g) Methods to be used to provide safety education to students;

(h) Methods to be used to assess a student's knowledge of safe practices and procedures.

6:53-2.3 Reporting requirements

(a) Accidents involving vocational education students, staff or others shall be reported to the Assistant Commissioner of Education, State Director of Vocational Education, on the Accident Report Form supplied by the Division of Vocational Education within five working days of the occurrence. A reportable accident is any accident that occurs in a vocational education course or program either on the school premises or at an approved cooperative work training station which requires treatment by a licensed medical doctor.

(b) The accident reporting requirement shall take effect ninety (90) days after the adoption of this section.

SUBCHAPTER 3. GENERAL REQUIREMENTS FOR ALL MACHINES

6:53-3.1 Machine guarding

(a) One or more methods of machine guarding shall be provided to protect the operator and other personnel in the machine area from hazards such as, but not limited to, those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are, but not limited to, barrier guards, two-hand tripping devices, electronic safety devices, etc.

(b) Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer a hazard in itself. Guards should be of the type commercially designed and constructed and shall meet the standards and specifications adopted and promulgated by nationally recognized standards producing organizations.

6:53-3.2 Securing machines and equipment

All machines and equipment, except portable machines and equipment, shall be secured to prevent walking or moving in accordance with the methods recommended by the manufacturer of the machines or equipment.

6:53-3.3 Point of operation guarding

(a) Point of operation is the area on a machine where work is actually performed upon the material being processed.

(b) The point of operation of any machine whose operation exposes an individual to injury shall be guarded. The guarding device shall be in conformity with all appropriate standards and shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

(c) Special handtools or appropriate devices for placing, removing or moving material shall be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools shall not be in lieu of other guarding required, but can only be used to supplement protection provided.

6:53-3.4 Unattended machines and equipment

Machines and equipment whose operation requires the presence of an operator shall not be left unattended while it is in operation.

6:53-3.5 Braking devices

Radial arm saws, non-portable cross cut and/or rip saws and band saws should be equipped with a braking device capable of stopping the rotation of the saw blade after the equipment has been shut off. The breaking device should be of a type provided by or recommended by the manufacturer of the equipment on which it is to be used.

SUBCHAPTER 4. EQUIPMENT LAYOUT AND WORK AREA

6:53-4.1 Machine location

(a) Machines shall be so located that there will be sufficient space in which to handle the material with the least possible interference from or to any person or machines in the area. Machines shall be so placed that it will not be necessary for anyone to stand in or so near an aisle as to be liable to hazard.

(b) Machines should be located, with respect to sources of both natural and artificial light, so that light of sufficient intensity will fall on the work. Supplementary illumination at the point of operation should be provided where necessary in accordance with ANSI A 11.1-1973, as revised, Practice for Industrial Lighting.

6:53-4.2 Work areas

(a) All floors shall be kept in good repair and shall be free from protruding nails, splinters, holes, unevenness, and loose boards. Floors in the working area about all machines shall be provided with effective means to prevent slipping.

(b) Emergency equipment, traffic aisles, and operator station areas shall be marked in accordance with ANSI Z 53.1-1971, as revised, Safety Color Coding for Marking Physical Hazards.

SUBCHAPTER 5. WOODWORKING MACHINERY REQUIREMENTS

6:53-5.1 Machine construction general

(a) Each machine shall be so constructed, installed and maintained as to be free from excessive vibration.

(b) Arbors and mandrels shall be constructed, installed and maintained so as to have firm and secure bearing and be free from play.

6:53-5.2 Machine controls and equipment

(a) An electrical power control shall be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving his position at the point of operation.

(b) On all non-portable motorized equipment and machinery, provisions shall be made to prevent machines from automatically restarting upon restoration of power after an electrical failure or electric cut-off as specified in N.J.A.C. 6:22-13.9.

(c) Power controls and operating controls shall be located within easy reach of the operator while he is at the regular work location, making it unnecessary for him to reach over the point of operation to make adjustments.

(d) Each machine operated by electric motors shall be provided with positive means for rendering the motor starting controls inoperative while repairs or tool changes are being made to the machines.

6:53-5.3 General requirements for hand fed circular saws

(a) Saw frames or tables shall be constructed with lugs cast on the frame or with an equivalent means to limit the size of the cutting device that can be mounted on the machine.

(b) Circular saw fences shall be so constructed that they can be firmly secured to the table or table assembly without changing their alignment with the cutting device. For machines with tilting tables or tilting arbors the fence shall be so constructed that it will remain in a line parallel with the cutting device, regardless of the angle of the cutting device with the table.

(c) Circular saw gauges shall be so constructed as to slide in grooves or tracks that are accurately machined, to insure exact alignment with the cutting device for all positions of the gauge.

(d) Hinged saw tables shall be so constructed that the table can be firmly secured in any position and in true alignment with the cutting device.

(e) For all circular saws where conditions are such that there is a possibility of contact with the portion of the cutting device either beneath or behind the table, that portion of the cutting device shall be covered with a guard that shall be so arranged as to prevent accidental contact with the cutting device.

(f) Revolving double arbor saws shall be fully guarded in accordance with all the requirements for circular crosscut saws or with all the requirements for circular ripsaws, according to the kind of cutting devices mounted on the arbors.

(g) No cutting device or tool collar shall be placed or mounted on a machine arbor unless the tool has been accurately machined to size and shape to fit the arbor.

(h) Combs (featherboards) or suitable jigs shall be provided for use when a standard guard cannot be used, as in dadoing, grooving, jointing, molding, and rabbeting.

6:53-5.4 Hand-fed ripsaws

(a) Each circular hand-fed ripsaw shall be provided with a guard which shall completely enclose that portion of the cutting device above the table. The guard and mounting shall be arranged so that the guard will automatically adjust itself to the thickness of and remain in contact with the material being cut but it shall not offer any considerable resistance to insertion of material to saw or to passage of the material being sawed. The guard shall be made of adequate strength to resist blows and strains incidental to reasonable operation, adjusting, and handling and shall be so designed as to protect the operator from flying splinters and broken saw teeth. It shall be made of material that is soft enough so that it will be unlikely to cause tooth breakage. The material should not shatter when broken, should be nonexplosive, and should be no more flammable than wood. The guard shall be so mounted as to insure that its operation will be positive, reliable, and in true alignment with the cutting device; and the mounting shall be adequate in strength to resist any reasonable side thrust or other force tending to throw it out of line. A fixed or manually adjusted guard may be used provided that the space between the bottom of the guard and the material being cut shall not exceed 3/8 inch if 1 1/2 inches or more from the blade, and 1/4 inch if closer than 1 1/2 inches.

(b) Each hand-fed circular ripsaw shall be equipped with a spreader to prevent material from squeezing the saw blade or being thrown back on the operator. The spreader shall be made of hard tempered steel, or its equivalent, and shall be thinner than the saw kerf. It shall be of sufficient width to provide adequate stiffness or rigidity to resist any reasonable side thrusts or blows tending to bend or throw it out of position. The spreader shall be attached so that it will remain in true alignment with the saw blade even when either the saw blade or table is tilted, and should be placed so that there is not more than one-half inch space between the spreader and the back of the saw blade when the largest saw blade is mounted in the machine. The provision of a spreader in connection with grooving, dadoing, or rabbeting is not required. On the completion of such operations, the spreader shall be immediately replaced.

(c) Each hand-fed circular ripsaw shall be provided with nonkickback fingers or dogs so located as to oppose the thrust or tendency of the saw blade to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thicknesses of materials being cut.

6:53-5.5 Hand-fed crosscut table saws

(a) Each circular crosscut table saw shall be provided with a guard which shall meet all the requirements of paragraph 6:53-5.4(a) of this section for guards for circular ripsaws.

(b) Each circular crosscut table saw shall also be provided with a spreader which should meet all the requirements of paragraph 6:53-5.4(b) of this section.

6:53-5.6 Radial arm saws

(a) The upper guard shall completely enclose the upper portion of the cutting device down to a point that will include the end of the saw arbor. The upper guard shall be constructed in such a manner and of such material that it will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the cutting device shall be guarded to the full diameter of the cutting device by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible to the operator during the operation being performed.

(b) Each radial arm saw used for ripping shall be provided with nonkickback fingers or dogs located on both sides of the saw blade so as to oppose the thrust or tendency of the saw blade to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thicknesses of material being cut.

(c) Ripping and ploughing shall be against the direction in which the cutting device rotates. The direction of the arbor rotation shall be conspicuously marked on the upper guard. In addition, a permanent label not less than 1 1/2 inches by 3/4 inches shall be affixed to the guard at the end of the guard at which the blade teeth exit the upper guard during the operation of the saw. The label shall read as follows: "Danger: Do Not Rip or Plough From This End." Such a label should be colored standard danger red.

(d) The radial arm saw shall be equipped with an automatic return device, or similar arrangement, that will cause the cutting head to return gently to the starting position when released by the operator.

(e) The radial arm saw shall be equipped with a full size cutting table that will effectively eliminate blade overhang at any cutting position.

6:53-5.7 Bandsaws and band resaws

(a) All portions of the saw blade shall be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table. Bandsaw wheels shall be fully encased. The outside periphery of the enclosure shall be solid. The front and back of the band wheels shall be enclosed by solid materials. The guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard shall protect the saw blade at the front and outer side. This portion of the guard shall be self-adjusting to raise and lower with the guide.

(b) Each bandsaw machine shall be provided with a tension control device to indicate a proper tension for the standard saw blades used on the machine, in order to assist in the elimination of saw blade breakage due to improper tension.

6:53-5.8 Jointers

(a) Each hand-fed planer and jointer with horizontal head shall be equipped with a cylindrical cutting head, the knife projection of which shall not exceed beyond the cylindrical body of the head further than recommended by the equipment manufacturer.

(b) The opening in the table shall be kept as small as possible. The clearance between the edge of the rear table and the cutter head shall be not more than one-eighth inch. The table throat opening shall be not more than 2 1/2 inches when tables are set or aligned with each other for zero cut.

(c) Each hand-fed jointer with a horizontal cutting head shall have an automatic guard which will cover all the section of the head on the working side of the fence or gauge. The guard shall effectively keep the operator's hand from coming in contact with the revolving knives. The guard shall automatically adjust itself to cover the unused portion of the head and shall remain in contact with the material at all times

(d) Each hand-fed jointer with horizontal cutting head shall have a guard which will cover the section of the head behind the gauge or fence.

(e) Each wood jointer with vertical head shall have either an exhaust hood or other guard so arranged as to enclose completely the revolving head, except for a slot of such width as may be necessary and convenient for the application of the material to be jointed.

6:53-5.9 Tenoning machines

(a) Feed chains and sprockets of all double end tenoning machines shall be completely enclosed, except for that portion of chain used for conveying the stock.

(b) At the rear ends of frames over which feed conveyors run, sprockets and chains shall be guarded at the sides by plates projecting beyond the periphery of sprockets and the ends of lugs.

(c) Each tenoning machine shall have all cutting heads, and saws if used, covered by metal guards. These guards shall cover at least the unused part of the periphery of the cutting head.

6:53-5.10 Boring and mortising machines

(a) Safety-bit chucks with no projecting set screws shall be used

(b) The top of the cutting chain and driving mechanism shall be enclosed.

(c) If there is a counterweight, one of the following or equivalent means shall be used to prevent its dropping:

1. It shall be bolted to the bar by means of a bolt passing through both bar and counterweight;

2. A bolt shall be put through the extreme end of the bar;

3. Where the counterweight does not encircle the bar, a safety chain shall be attached to it;

4. Other types of counterweights shall be suspended by chain or wire rope and shall travel in a pipe or other suitable enclosure wherever they might fall and cause injury.

(d) Universal joints on spindles of boring machines shall be completely enclosed in such a way as to prevent accidental contact by the operator.

6:53-5.11 Wood shapers and similar equipment

(a) The cutting heads of each wood shaper, hand-fed panel raiser, or other similar machine, shall be enclosed with an adjustable guard so designed as to keep the operator's hand away from the cutting edge. The diameter of circular shaper guards shall be not less than the greatest diameter of the cutter.

(b) Cylindrical heads should be used whenever the nature of the work will permit. Single cutter knives in shaper heads shall not be used.

(c) All double-spindle shapers shall be provided with a spindle starting and stopping device for each spindle.

6:53-5.12 Planing or molding machines

(a) Each planing or molding machine shall have all cutting heads, and saws if used, covered by a metal guard.

(b) Where an exhaust system is used, the guards shall form part or all of the exhaust hood.

(c) Feed rolls shall be guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard shall be fastened to the frame carrying the rolls so as to remain in adjustment for any thickness of stock.

(d) Surfacers or planers used in thicknessing multiple pieces of material simultaneously shall be provided with sectional infeed rolls having sufficient yield in the construction of the sections to provide feeding contact pressure on the stock, over the permissible range of variation in stock thickness specified or for which the machine is designed. In lieu of such yielding sectional rolls, suitable section kickback finger devices shall be provided at the infeed end.

6:53-5.13 Wood lathes

(a) Each wood lathe shall have all cutting heads, if so equipped, covered by a metal guard.

(b) Cutting heads on wood lathes, whether rotating or not, shall be covered as completely as possible by hoods or shields, which should be hinged to the machines so that they can be thrown back for making adjustments.

(c) Automatic woodturning lathes of the rotating knife type shall be equipped with hoods enclosing the cutter blades completely except at the contact points while the stock is being cut.

(d) Lathes used for turning wood stock shall be equipped with long curved guards extending over the tops of the lathes in order to prevent the work pieces from being thrown out of the machines if they should become loose.

6:53-5.14 Sanding machines

(a) Feed rolls of self-feed sanding machines shall be protected with a semicylindrical guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard shall be constructed of heavy material, preferably metal, and firmly secured to the frame carrying the rolls so as to remain in adjustment for any thickness of stock. The bottom of the guard should come down to within three-eighths inch of a plane formed by the bottom or contact face of the feed roll where it touches the stock.

(b) Each drum sanding machine shall have an exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving drum, except for that portion of the drum above the table, which may be necessary and convenient for the application of the material to be finished.

(c) Each disc sanding machine shall have the exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving disc, except for that portion of the disc above the table, which may be necessary and convenient for the application of the material to be finished.

(d) Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contacts.

(e) Combination disc/belt sanding machines shall not be used by more than one operator at any time.

6:53-5.15 Inspection and maintenance of woodworking machinery

It shall be the responsibility of the instructor to insure that:

(a) Dull, badly set, improperly filed, or improperly tensioned saw blades shall be immediately removed from service, before they begin to cause the material to stick, jam, or kick back when it is fed to the saw at normal speed. Saw blades to which gum has adhered on the sides shall be immediately removed and cleaned.

(b) All knives and cutting heads of woodworking machines shall be kept sharp, properly adjusted, firmly secured and properly balanced.

(c) Bearings shall be kept free from lost motion and shall be well lubricated.

(J) Arbors of all circular saws shall be free from play.

(e) Cleanliness shall be maintained around woodworking machinery, particularly as regards the effective functioning of guards and the prevention of fire hazards in switch enclosures, bearings, and motors.

(f) All cracked saws shall be removed from service.

(g) The practice of inserting wedges between the saw disc and the collar to form what is commonly known as a "wobble saw" shall not be permitted.

(h) Push sticks or push blocks shall be provided in the several sizes and types suitable for the work to be done.

(i) Bandsaws and resaws containing twists or kinks shall be promptly removed from service.

(j) To avoid vibration, brazed joints in bandsaws and band resaws shall be the same thickness as the saw blade.

SUBCHAPTER 6. WELDING, CUTTING AND BRAZING OPERATIONS

6:53-6.1 Oxygen-fuel gas welding and cutting systems

(a) General requirements

1. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch, shall be allowed unless approved for the purpose.

2. Under no condition shall acetylene be generated, piped (except in approved cylinder manifolds) or utilized at a pressure in excess of 15 p.s.i. gauge pressure or 30 p.s.i. absolute pressure. This requirement is not intended to apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to U.S. Department of Transportation (USDOT) requirements, or to acetylene for chemical use.

3. The use of liquid acetylene shall be prohibited.

4. Only approved apparatus such as torches, regulators or pressure-reducing valves, and manifolds shall be used.

(b) Marking of approved cylinders and containers

1. All portable cylinders used for the storage and shipment of compressed gases shall be constructed and maintained in accordance with the regulations of the U.S. Department of Transportation (USDOT), 49 CFR Parts 171-179.

2. Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever practical, the marking shall be located on the shoulder of the cylinder in conformance with ANSI Z 48.1 - 1954(R1971), as revised, "Method for Marking Portable Compressed Gas Containers to Identify the Material Contained."

3. Compressed gas cylinders shall be equipped with connections complying with ANSI B 57.1 - 1976, as revised, "Compressed Gas Cylinder Valve Outlet and Inlet Connections."

4. All cylinders with a water weight capacity of over 30 pounds shall be equipped with means of connecting a valve protection cap or with a collar or recess to protect the valve.

(c) Storage of cylinders-general

1. Cylinders shall be kept away from radiators and other direct sources of heat.

2. Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location at least 20 feet from highly

combustible materials such as oil or excelsior. Cylinders shall be stored valve end up in definitely assigned places away from elevators, stairs, or gangways. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards. Cylinders shall be adequately secured with safety chains or equivalent means.

3. Empty cylinders shall have their valves closed and be appropriately marked.

4. Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight except when cylinders are in use or connected for use.

(d) Storage of fuel-gas

1. Inside a building, cylinders, except those in actual use or attached ready for use, shall be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of liquefied petroleum gas.

2. For storage in excess of 2,000 cubic feet total gas capacity of cylinders or 300 pounds of liquefied petroleum gas, a separate room or compartment shall be provided, or cylinders shall be kept outside or in a special building. Special buildings, rooms or compartments shall have no open flame for heating or lighting and shall be well ventilated. Signs shall be conspicuously posted in such rooms reading, "Danger--No Smoking, Matches or Open Lights," or other equivalent wording.

3. Acetylene cylinders shall be stored valve end up.

(e) Storage of Oxygen

1. Oxygen cylinders shall not be stored near highly combustible material, especially oil and grease, or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire.

2. Oxygen cylinders in storage shall be separate from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least five (5) feet high having a fire-resistance rating of at least one-half hour.

(f) General operating and transporting procedures

1. Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen shall never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

2. Cylinders shall not be dropped or struck or permitted to strike each other violently.

3. Valve-protection caps shall not be used for lifting cylinders from one vertical position to another.

4. Unless cylinders are secured on a special truck, regulators shall be removed and valve-protection caps, when provided for, shall be put in place before cylinders are moved.

5. Cylinders not having fixed hand wheels shall have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations, only one key or handle is required for each manifold.

6. Cylinder valves shall be closed when work is finished.

7. Cylinder valves shall be closed before moving cylinders.

8. Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields shall be provided.

9. Cylinders shall not be placed where they might become part of an electric circuit. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. Any practice such as the tapping of an electrode against a cylinder to strike an arc shall be prohibited.

10. Cylinders shall never be used as rollers or supports, whether full or empty.

11. The number and markings stamped into cylinders shall not be tampered with.

12. No person shall attempt to mix gases in a cylinder or refill a cylinder.

13. No one shall tamper with safety devices in cylinders or valves.

14. Unless connected to a manifold, oxygen from a cylinder shall not be used without first attaching an oxygen regulator to the cylinder valve. Before connecting the regulator to the cylinder valve, the valve shall be opened slightly for an instant and then closed.

(g) Handling and use of fuel-gas cylinders

1. Fuel-gas cylinders shall be placed with valve end up whenever they are in use. Liquified gases shall be stored with the valve end up.

2. Before connecting a regulator to a fuel-gas cylinder valve, the valve shall be opened slightly and closed immediately. This operation shall not be done near other welding work or near sparks, flame, or other possible sources of ignition.

3. Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and the gas released from the regulator.

4. If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied. The area around the cylinder shall be cleared of personnel. The supplier shall be immediately notified.

5. Fuel-gas shall never be used from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

6. An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

7. Where a special wrench is required it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench shall always be available for immediate use.

6:53-6.2 Arc welding and cutting systems

(a) Application of arc welding equipment

1. Assurance of consideration of safety in design is obtainable by choosing apparatus complying with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C 33.2-1972, as revised, Underwriters Laboratories.

2. Environmental conditions

i. Standard machines for arc welding service shall be designed and constructed to carry their rated load with rated temperature rises where the temperature of the cooling air does not exceed 40° C. (104° F.) and where the altitude does not exceed 3,300 feet, and shall be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

ii. Unusual service conditions may exist and in such circumstances machines shall be especially designed to safely meet the requirements of the service. Chief among these conditions are:

(1) Exposure to unusually corrosive fumes.

(2) Exposure to steam or excessive humidity.

(3) Exposure to excessive oil vapor.

(4) Exposure to flammable gases.

(5) Exposure to abnormal vibration or shock.

(6) Exposure to excessive dust.

(7) Exposure to weather.

3. Open circuit (no load) voltages of arc welding and cutting machines should be as low as possible consistent with satisfactory welding or cutting being done. The following limits shall not be exceeded:

i. Alternating-current machines

(1) Manual arc welding and cutting - 80 volts.

(2) Automatic (machine or mechanized) arc welding and cutting - 100 volts.

ii. Direct-current machines

(1) Manual arc welding and cutting - 100 volts.

(2) Automatic (machine or mechanized) arc welding and cutting - 100 volts.

iii. When special welding and cutting processes require values of open circuit voltages higher than the above, means shall be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.

4. Design requirements

i. A controller integrally mounted in an electric motor driven welder shall have capacity for carrying rated motor current, shall be capable of making and interrupting stalled rotor current of the motor, and may serve as the running overcurrent device if provided with the number of overcurrent units as specified by NFPA No. 70-1975, as revised, National Electrical Code. Starters with magnetic under-voltage release shall be used with machines installed more than one to a circuit to prevent circuit overload caused by simultaneous starting of several motors upon return of voltage.

ii. On all types of arc welding machines, control apparatus shall be enclosed except for the operating wheels, levers, or handles. Control handles and wheels shall be large enough to be easily grasped by a gloved hand.

iii. Input power terminals, tap change devices and live metal parts connected to input circuits shall be completely enclosed and accessible only by means of tools.

iv. Terminals for welding leads shall be protected from accidental electrical contact by personnel or by metal objects.

Protection may be obtained by use of: deadfront receptacles for plug connections; recessed openings with nonremovable hinged covers; heavy insulating sleeving or taping or other equivalent electrical and mechanical protection. If a welding lead terminal which is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal shall be marked to indicate that it is grounded.

v. No connections for portable control devices such as push buttons to be carried by the operator shall be connected to an a.c. circuit of higher than 120 volts. Exposed metal parts of portable control devices operating on circuits above 50 volts shall be grounded by a grounding conductor in the control cable.

(b) Installation of arc welding equipment

1. Installation including power supply shall be in accordance with the requirements of NFPA No. 70-1975, as revised, National Electrical Code.

2. Grounding

i. The frame or case of the welding machine (except engine-driven machines) shall be grounded under the conditions and according to the methods prescribed NFPA No. 70-1975, as revised, National Electrical Code.

ii. Conduits containing electrical conductors shall not be used for completing a work-lead circuit. Pipelines shall not be used as a permanent part of a work-lead circuit, but may be used during construction, extension or repair providing current is not carried through threaded joints, flanged bolted joints, or caulked jointly and that special precautions are used to avoid sparking at connection of the work-lead cable.

iii. Where a structure, conveyor, or fixture is regularly employed as a welding current return circuit, joints shall be bonded or provided with adequate current collecting devices and appropriate periodic inspection shall be conducted to ascertain that no condition of electrolysis or shock, or fire hazard exists by virtue of such use.

iv. All ground connections shall be mechanically strong and electrically adequate for the required current.

3. Supply connections and conductors

i. A disconnecting switch or controller shall be provided at or near arc welding machines which are not equipped with such a switch or controller mounted as an integral part of the machine. The switch shall be in accordance with NFPA No. 70-1975, as revised, National Electrical Code. Overcurrent protection shall be provided as specified in NFPA No. 70-1975, as revised, National Electrical Code.

A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by NFPA No. 70-1975, as revised, National Electrical Code, shall be provided for each outlet intended for connection to a portable welding machine.

ii. For individual welding machines, the rated current-carrying capacity of the supply conductors shall be not less than the rated primary current of the welding machines.

iii. For groups of welding machines, the rated current-carrying capacity of conductors may be less than the sum of the rated primary currents of the welding machines supplied. The conductor rating shall be determined in each case according to the machine loading based on the use to be made of each welding machine and the allowance permissible in the event that all the welding machines supplied by the conductors will not be in use at the same time.

(c) Operation and maintenance

1. Before starting operations all connections to the machine shall be checked to make certain they are properly made. The work lead shall be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation.

2. Grounding of the welding machine frame shall be checked. Special attention shall be given to safety ground connections of portable machines.

3. There shall be no leaks of cooling water, shielding gas or engine fuel.

4. Proper switching equipment for shutting down the machine shall be provided.

5. Printed rules and instructions covering operation of equipment supplied by the manufacturers shall be strictly followed.

6. Electrode holders when not in use shall be so placed that they cannot make electrical contact with persons, conducting objects, and fuel or compressed gas tanks.

7. Cables with splices within 10 feet of the holder shall not be used. The welder shall not coil or loop welding electrode cable around parts of his or her body.

8. The operator should report any equipment defect or safety hazard to his instructor and the use of the equipment shall be discontinued until its safety has been assured. Repairs shall be made only by qualified personnel.

9. Machines which have become wet shall be thoroughly dried and tested before being used.

10. Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for the purpose. The connecting means shall have insulation adequate for the service conditions.

6:53-6.3 Resistance welding systems

(a) General requirements

1. All equipment shall be installed in conformance with NFPA No. 70-1975, as revised, National Electrical Code. There shall be a safety-type disconnecting switch or a circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

2. Ignitron tubes used in resistance welding equipment shall be equipped with a thermal protection switch.

3. Controls of all automatic or air and hydraulic clamps shall be arranged or guarded to prevent the operator from accidentally activating them.

(b) Spot and seam welding machines (nonportable)

1. All external weld initiating control circuits shall operate on low voltage, not over 120 volts, for the safety of the operators.

2. Stored energy or capacitor discharge type of resistance welding equipment and control panels involving high voltage (over 550 volts) shall be suitably insulated and protected by complete enclosures, all doors of which shall be provided with suitable interlocks and contacts wired into the control circuit (similar to elevator interlocks). Such interlocks or contacts shall be so designed as to effectively interrupt power and short circuit all capacitors when the door or panel is open. A manually operated switch or suitable positive device shall be so designed as to effectively interrupt power and short circuit all capacitors when the door or panel is open. A manually operated switch or suitable positive device shall be installed, in addition to the mechanical interlocks or contacts, as an added safety measure assuring absolute discharge of all capacitors.

3. All doors and access panels of all resistance welding machines and control panels shall be kept locked and interlocked to prevent access, by unauthorized persons, to live portions of the equipment.

6:53-6.4 Welding or cutting containers

(a) No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.

(b) All hollow spaces, cavities, or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

6:53-6.5 Protection of personnel

(a) General requirements

1. A welder or assistant working on platforms, scaffolds, or runways shall be protected against falling. This may be accomplished by the use of railings, safety belts, life lines, or some other equally effective safeguards.

2. Welders shall place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

(b) Eye protection for welding operations

1. Selection

i. Helmets or hand shields shall be used during all arc welding or arc cutting operations, excluding submerged arc welding. Goggles shall also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work and from flying objects. The goggles may have either clear or colored glass, depending upon the amount of exposure to adjacent welding operations. Helpers or observers shall be provided with proper eye protection.

ii. Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles with side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection.

iii. All welders and assistants engaged in the use of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

iv. Eye protection in the form of suitable goggles shall be provided where needed for brazing operations not covered in i, ii, and iii of this paragraph.

2. Specifications for protectors

i. Helmets and hand shields shall be made of a material which is an insulator for heat and electricity. Helmets, shields and goggles shall be not readily flammable and shall be capable of withstanding sterilization.

ii. Helmets and hand shields shall be arranged to protect the face, neck and ears from direct radiant energy from the arc.

iii. Helmets shall be provided with filter plates and cover plates designed for easy removal.

iv. All parts shall be constructed of a material which will not readily corrode or discolor the skin.

v. Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

vi. Cover lenses or plates shall be provided to protect each helmet, hand shield or goggle filter lens or plate.

vii. All glass for lenses shall be tempered, substantially free from striae, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel.

viii. Lenses shall bear some permanent distinctive markings by which the source and shade may be readily identified.

ix. The following is a guide for the selection of the proper shade numbers.

Welding operation	Shade No.
Shielded metal-arc welding - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous) - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous) - 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding:	
3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

Note: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

x. All filter lenses and plates shall meet requirements prescribed in ANSI Z 87.1-1968, as revised, American National Standard Practice for Occupational and Educational Eye and Face Protection.

3. Where the work permits, the welder shall be enclosed in an individual booth painted with a finish of low reflectivity or shall be enclosed with noncombustible screens similarly painted or equivalent. Booths and screens shall permit circulation of air at floor level. Other persons adjacent to the welding areas shall be protected from the rays by noncombustible or flameproof screens or shields or shall be required to wear appropriate goggles.

(c) Protective clothing

1. Individuals exposed to the hazards created by welding, cutting, or brazing operations shall be protected by personal protective equipment. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

2. Specified protective clothing. Protective means which shall be employed are as follows:

i. All welders shall wear flameproof gauntlet gloves.

ii. Flameproof aprons made of leather, inhibited asbestos, or other suitable materials shall be used to protect against radiated heat and sparks.

iii. All outer clothing such as jumpers or overalls shall be reasonably free from oil or grease.

iv. Sparks may lodge in rolled-up sleeves or pockets of clothing, or cuffs of overalls or trousers. It is therefore recommended that sleeves and collars be kept buttoned and pockets be eliminated from the front of overalls and aprons. Trousers or overalls should not be turned up on the outside.

v. For heavy work, fire-resistent leggings, high boots, or other equivalent means shall be used.

vi. Capes or shoulder covers made of leather or other suitable materials shall be worn during overhead welding or cutting operations. Leather skull caps, or equivalent shall be worn under helmets to prevent head burns.

vii. Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors shall be used.

SUBCHAPTER 7. HAND AND PORTABLE POWER TOOLS AND OTHER HAND-HELD EQUIPMENT

6:53-7.1 Condition of tools

(a) All hand and portable power tools and similar equipment, shall be maintained in a safe condition according to the recommendations of the manufacturer.

6:53-7.2 General guarding

(a) When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

(b) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, or moving parts of equipment shall be guarded if such parts are exposed to contact or otherwise create a hazard.

6:53-7.3 Personnel protection

Individuals using hand and power tools and exposed to the hazards of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard in accordance with N.J.A.C. 6:3-1.14.

6:53-7.4 Switches

(a) All hand-held powered platen sanders, grinders with wheels 2-inch diameter or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks one-fourth of an inch wide or less may be equipped with only a positive "on-off" control.

(b) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders, belt sanders, reciprocating saws, saber saws, and other similar operating powered tools shall be equipped with a momentary contact "on-off" control and may have a lock-on control provided that the turn off can be accomplished by a single motion of the same finger or fingers that turn it on.

(c) All other hand-held powered tools, such as circular saws, chain saws, and percussion tools without positive accessory holding means, shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

(d) Electric power operated tools shall either be of the approved double-insulated type or grounded in accordance with NFPA No. 70-1975, as revised, National Electrical Code.

6:53-7.5 Portable powered tools

(a) All portable, power-driven circular saws having a blade diameter greater than two inches shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw blade to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for

bevel cuts. The lower guard shall cover the saw blade to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position.

(b) Portable belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact.

6:53-7.6 Pneumatic powered tools and hose

(a) A tool retainer shall be installed on each piece of utilization equipment which, without such a retainer, may eject the tool.

(b) Airhose and airhose connections used for conducting compressed air to utilization equipment shall be designed for the pressure and service to which they are subjected.

6:53-7.7 Explosive-actuated fastening tools

(a) General requirements

1. Explosive-actuated fastening tools which are actuated by explosives or any similar means and propel a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object shall meet the design requirements in "American National Standard Safety Requirements for Explosive-Actuated Fastening Tools," ANSI A 10.2-1970, as revised.

2. Operators and assistants using tools shall be safeguarded by means of eye protection.

3. Operators shall be trained in the use of the tool as recommended by the tool manufacturer.

(b) Inspection, maintenance, and tool handling

1. High-velocity tools shall have the characteristics outlined in i. through ix. of this paragraph and, at the discretion of the manufacturer, any additional safety features he may wish to incorporate.

i. The muzzle end of the tool shall have a protective shield or guard at least 3 1/2 inches in diameter, mounted perpendicular to and concentric with the barrel, and designed to confine any flying fragments or particles that might otherwise create a hazard at the time of firing.

ii. Where a standard shield or guard cannot be used, or where it does not cover all apparent avenues through which flying particles might escape, a special shield, guard, fixture, or jig designed and built by the manufacturer of the tool being used, which provides this degree of protection, shall be used as a substitute.

iii. The tool shall be so designed that it cannot be fired unless it is equipped with a standard protective shield or guard, or a special shield, guard, fixture, or jig.

iv. The firing mechanism shall be so designed that the tool cannot fire during loading or preparation to fire, or if the tool should be dropped while loaded.

v. Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

vi. The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against the work surface with a force at least 5 pounds greater than the total weight of the tool.

vii. The tool shall be so designed that it will not operate when equipped with the standard guard indexed to the center position if any bearing surface of the guard is tilted more than 8 degrees from contact with the work surface.

viii. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

ix. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

2. Tools of the low-velocity-piston type shall have the characteristics outlined in i. through vi. of this paragraph and, at the discretion of the manufacturer, any additional safety features he may wish to incorporate.

i. The muzzle end of the tool shall be designed so that suitable protective shields, guards, jigs, or fixtures, designed and built by the manufacturer of the tool being used, can be mounted perpendicular to the barrel. A standard spall shield shall be supplied with each tool.

ii. The tool shall be designed so that it shall not in ordinary usage propel or discharge a stud, pin, or fastener while loading or during preparation to fire, or if the tool should be dropped while loaded.

iii. Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

iv. The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against the work surface with a force at least 5 pounds greater than a total weight of the tool.

v. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

vi. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

3. Tools of the hammer-operated piston tools--low-velocity type shall have the characteristics outlined in i. through v. of this paragraph and, at the discretion of the manufacturer, any additional safety features he may wish to incorporate.

i. The muzzle end of the tool shall be so designed that suitable protective shields, guards, jigs, or fixtures, designed and built by the manufacturer of the tool being used, can be mounted perpendicular to the barrel. A standard spall shield shall be supplied with each tool.

ii. The tool shall be so designed that it shall not in ordinary usage propel or discharge a stud, pin, or fastener while loading, or during preparation to fire, or if the tool should be dropped while loaded.

iii. Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

iv. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

v. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(c) Operating requirements

1. Before using a tool, the operator, under the direction of the instructor, shall inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.

2. When a tool develops a defect during use, the operator shall immediately cease to use it, until it is properly repaired.

3. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at anyone and hands should be kept clear of the open barrel end.

4. No tools shall be loaded unless being prepared for immediate use, nor shall an unattended tool be left loaded.

5. In case of a misfire, the operator shall hold the tool in the operating position for at least 30 seconds. He shall then try to operate the tool a second time. He shall wait another 30 seconds, holding the tool in the operating position; then he shall proceed to remove the explosive load in strict accordance with the manufacturer's instructions. Misfired cartridges should be placed carefully in a metal container filled with water.

6. A tool shall never be left unattended in a place where it would be available to unauthorized persons.

7. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile.

8. Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying-missile hazard on the other side.

9. Fasteners shall not be driven directly into materials such as brick or concrete closer than 3 inches from the unsupported edge or corner, or into steel surfaces closer than one-half inch from the unsupported edge or corner, unless a special guard, fixture, or jig is used. (Exception: Low-velocity tools may drive no closer than 2 inches from an edge in concrete or one-fourth inch in steel.)

10. When fastening other materials, such as a 2- by 4-inch wood section to a concrete surface, it is permissible to drive a fastener of no greater than 7/32-inch shank diameter not closer than 2 inches from the unsupported edge or corner of the work surface.

11. Fasteners shall not be driven through existing holes unless a positive guide is used to secure accurate alignment.

12. No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

13. Tools shall not be used in an explosive or flammable atmosphere.

14. All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

15. Any tool found not in proper working order shall be immediately removed from service. The tool shall be inspected at regular intervals and shall be repaired in accordance with the manufacturer's specifications.

SUBCHAPTER 8. HAZARDOUS LIQUIDS AND MATERIALS

6:53-8.1 Storage of materials

(a) Flammable and combustible liquids in storage shall be kept in the original closed container supplied by the manufacturer or in approved safety cans.

(b) Flammable or combustible liquids not in storage and ready for use shall be transferred from the original closed container to approved safety cans. This does not apply to finishing or other materials designed to be used from the original closed container provided the container is resealed immediately after use.

(c) Approved oily waste cans shall be provided for the disposal of materials that have come into contact with flammable or combustible liquids or other materials that can support spontaneous combustion.

(d) Flammable or combustible liquids shall be stored in accordance with the requirements as specified in N.J.A.C. 6:22-13.1(o).

6:53-8.2 Hazardous materials

(a) All potentially hazardous materials shall be stored, handled and used according to the instructions of the manufacturer or distributor of the material.

(b) If adequate instruction for the storage, handling and use is not provided when the potentially hazardous material is secured, a Safety Data Sheet shall be procured from the manufacturer or distributor of the material prior to use.

SUBCHAPTER 9. PERSONAL PROTECTION

6:53-9.1 General provisions

(a) Hair that may become caught or entangled in any moving equipment, machine, tool or mechanical power transmission device shall be covered or secured in such a manner that the hair will be held close to the scalp. The securing or holding device shall be of such a design that it does not in itself constitute a hazard.

(b) Open type footwear shall not be permitted to be worn by individuals engaged in activities or processes that could readily lead to foot injuries.

(c) Individuals engaged in any activity as part of a vocational education course or program in which there is a recognized hazard from falling or flying objects shall wear industrial quality head protection meeting the requirements and specifications contained in ANSI Z 89.1-1969, as revised, "Safety Requirements for Industrial Head Protection."

6:53-9.2 Foundry operations

(a) Individuals engaged in the melting of metal to be cast or the pouring of molten metals shall be protected by the wearing of:

1. Melters goggles with shade No. 3 lense;

2. full face shield;

3. inhibited asbestos or fireproof duck bib type apron that extends below the top of leggings, or equivalent;

4. inhibited asbestos or fireproof duck spring type leggings;

5. molder's sleeves;

6. inhibited asbestos gloves;

7. closed leather footwear, or equivalent.

(b) Crucible shanks

1. Crucible shanks used for pouring molten metal from the crucible shall be equipped with a safety lock designed to prevent the crucible from dropping or slipping out of the shank while the molten metal is being poured or transported.

6:53-9.3 Spray finishing operations

(a) Individuals engaged in spray finishing operations shall wear respirators of a type designed to protect the individual from inhaling the mist, fumes, or vapors as specified by the manufacturer of the finishing material.

(b) Respirators may be of the disposable or non-disposable type. Provisions shall be made for sterilization of shared, non-disposable type respirators.

6:53-9.4 Emergency eye wash facilities

(a) Emergency eye wash equipment shall be installed in areas in which acid base battery electrolytes are used.

(b) Emergency eye wash stations may be of the portable or permanently installed type. Eye wash stations shall be inspected and maintained in accordance with the recommendations of the manufacturer.

6:53-9.5 Compressed air used for cleaning

(a) Compressed air used for cleaning purposes shall not be in excess of 30 (thirty) p.s.i.

(b) Compressed air pressure shall be kept below 30 p.s.i. by regulating line pressure to an acceptable level, installing a self regulated type safety air nozzle, installing a pressure reducing safety adapter or other similar means.

(Appendix B)

State of New Jersey
DEPARTMENT OF EDUCATION
225 WEST STATE STREET
P.O. BOX 2019
TRENTON, NEW JERSEY 08625

June 21, 1978

TO: County Superintendents of Schools
Chief School Administrators
Directors of Educational Improvement Centers
Principals
Vocational Education Administrators, Supervisors, Teachers, and Teacher Educators

RE: Vocational Education Accident Reporting System

The first of what will be an ongoing series of reports concerning the results and analysis of the Vocational Education Course/Program/Activity Accident Reporting System is attached for your information and review.

The reporting system was begun so that problem areas related to the safe operation of vocational education programs could be identified. Once identified, necessary steps can be taken to reduce or eliminate accidental injury.

This first general summary is designed to make you aware of the reported accident experience through April 30, 1978. In addition, recommendations have been provided that may be used in your programs to help reduce or avoid accidental injury in specific areas.

Future bulletins of this type will be produced on a quarterly basis. Information contained in these bulletins will provide a summary of the continuing results of the reporting system and a more in-depth analysis of problems in specific vocational program areas.

Your support in responding to the accident reporting system is very much appreciated. It is anticipated that your continued involvement will provide input that will lead to the reduction or elimination of accidental injuries in vocational education activities in New Jersey schools.

W. W.

William Wenzel, Ed.D.
Assistant Commissioner of Education
Division of Vocational Education

Attachment

VOCATIONAL EDUCATION ACCIDENT REPORTING SYSTEM

INTRODUCTION

The Vocational Education Course/Program/Activity Accident Reporting System has been operational since mid-December, 1977. Information regarding the system and copies of the reporting forms have been given broad distribution to all local education agencies in the State of New Jersey. Response to the system is now stable and districts are submitting accident reports for reportable accidents on a regular basis.

Accident information reports submitted to the Division of Vocational Education reflect only those accidental injuries that:

1. involved staff, students or others engaged in vocational education course or program activities; and

2. required treatment of the injured person by a licensed medical doctor.

Accidents that may be categorized as "minor", "near misses" or that resulted in property damage only were not reported.

The statistical information to follow summarizes the accident information for the period December 9, 1977 through April 30, 1978.

STATISTICAL SUMMARY

All information may not have been recorded on the accident report form when the report was forwarded. Therefore, percentages given for items within a category (e.g. Ankle) are based on the total number of reported items within each separate category (e.g. Part of Body Injured). Percentages in each category may not equal 100% because items of less than 1% are not included in this summary.

Estimated Number of Working Days: 96

Total Reportable Accidents 424

Male:	354 (83.5%)
Female:	70 (16.5%)

Approximate % by Grade Level:

6-	1%	10-	21%
7-	7%	11-	24%
8-	5%	12-	25%
9-	17%		

Approximate % by Age Level:

12-14	20%
15-20	79%

Status of Person Injured:

Student:	93%
Instructor	6%

Injured Person Sent to:

Physician:	36%
Hospital	64%

Time of Accident:

A.M.:	57%
P.M.:	43%

Program/Activity in Which Accident Occurred:

Agriculture/Agri-Business/Natural Resources	1%
Cooperative Education	9%
Consumer/Homemaking	2%
Distributive Education	2%
Health Occupations	2%
Home Economics Related Occupations	2%
Industrial Arts Education	38%
Vocational-Industrial Education	42%

Part of Body Injured:

Ankle:	1%	Knee:	2%
Arm:	5%	Leg:	2%
Back:	3%	Scalp:	2%
Eye:	13%	Teeth:	2%
Face:	3%	Wrist:	1%
Finger:	42%	Other:	4%
Foot:	2%		
Hand:	13%		

Apparent Nature of Injury:

Abrasion:	9%	Cut/Laceration	46%
Amputation	2%	Fracture:	5%
Bruise:	6%	Puncture:	4%
Bump:	2%	Splinter:	1%
Burn:	9%	Scratches:	2%
		Sprain:	5%
		Other:	7%

Cause of Injury:

Struck Against:	29%
Struck By:	30%
Fall from Elevation:	1%
Fall from Same Level:	5%
Caught In/Under/Between:	11%
Rubbed or Abraded:	7%
Overexertion:	2%
Contact with Caustic/Toxic/Noxious Substance:	7%
Contact with Temperature Extremes:	5%
Other:	2%

Degree of Injury:

Non-Disabling:	77%
Temporary Disability	22%

DISCUSSION AND RECOMMENDATIONS

The statistical data being developed and the ongoing review of all incoming accident reports provides the basis for the following discussion and recommendations.

Discussion

1. As would be expected, the greatest numbers of accidents occurred in those vocational education programs and activities in which there is the most interaction between students/instructors and tools, machines and equipment. Interesting to note is that percentages by Program/Activity are somewhat deceiving. The areas showing the highest numbers of accidental injuries are Cooperative Education (9%), Vocational-Industrial Education (42%), and Industrial Arts Education (38%). The percentages, however, do not reflect the potential exposure to the numbers of participants in those programs/activities. The numbers of accidents take on new meaning when the accident percentages are viewed against the estimated annual enrollments. Estimated annual enrollments in the three programs mentioned are 330,000 in Industrial Arts Education, 42,000 in Vocational-Industrial Education and 17,000 in Cooperative Education.

2. The numbers of accident reports indicating injury to the eyes is very significant. The 13% figure represents 57 people. A review of the descriptions of the accidents indicates, for the most part, that:

a. eye protection was not being worn or being worn improperly; or

b. the type of eye protection device being used may not have been proper for the type of work being engaged in by the injured person.

3. Cuts and lacerations to the fingers and hands is another area of significance. Cuts and lacerations represent the bulk of the Apparent Nature of Injury section with 46%. The majority of the injuries occured in woodworking and metalworking related activities. The description of this type of accident revealed primarily, that the person injured came into contact with cutting or abrading devices at the point of operation. The kinds of equipment most often involved in these injuries were band saws (both wood and metal cutting), table saws, stationary sanding/grinding equipment, drill presses, and various power and non-power driven portable hand tools.

Recommendations

1. Local boards of education should review their present eye protection program to assure that the established practices and procedures are in compliance with legislative mandates and State Board of Education rules and regulations. Local boards of education should assure that:

a. Industrial quality eye protection devices meeting, as a minimum, all requirements specified in the American National Standard, "Practice for Occupational and Educational Eye and Face Protection", ANSI Z87.1-1968, are provided.

b. Standard policies have been established for the wearing of industrial quality eye protection devices and they are enforced.

c. Learning situations have been analyzed in order to detect potential eye safety hazards. Eye protection devices to protect students, instructors and others from those hazards are available and used. Additional attention should be given where activities include the use of chemicals, acids, caustics, sprays, solvents and welding operations. Included should be a review of the work situations of students involved in cooperative education programs in and out of the school building.

2. Instructors and administrators responsible for the teaching of machine, tool and equipment use to learners should review their educational procedures and materials. The review should be made to determine if additional emphasis is needed to help assure the safe use of machines, tools and equipment by students. Specific areas of concern are that:

   a. Machines and equipment have proper guarding and safety devices and the guards and safety devices are in place when operations are performed.

   b. Adjustments to machines and equipment are not made while the item is in operation or "coasting."

   c. All cutting devices are kept sharp so that minimum pressure is needed to perform the cutting operation.

   d. Material on which an operation is being performed is securely fastened when appropriate.

   e. Machines and equipment are positively disconnected from the power source when repairs or cutting device changes are being made.

   f. Push sticks or similar devices are used as appropriate.

   g. The student operator is given adequate instruction in the safe use of machines, tools and equipment and has the permission of the instructor to perform operations.

3. Accidents that take place in vocational education courses and programs should be analyzed regularly so that appropriate steps can be taken to avoid future recurrences. It is vitally important that "near misses" and minor accidents be investigated in addition to those that are reportable to the Division of Vocational Education. The analysis will help identify potentially hazardous situations so that corrective actions can be initiated.

June 12, 1978 WRS
Division of Vocational Education
N.J. Department of Education
Report Number: One